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THE
WONDERFUL HOUSE
I LIVE IN

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THE

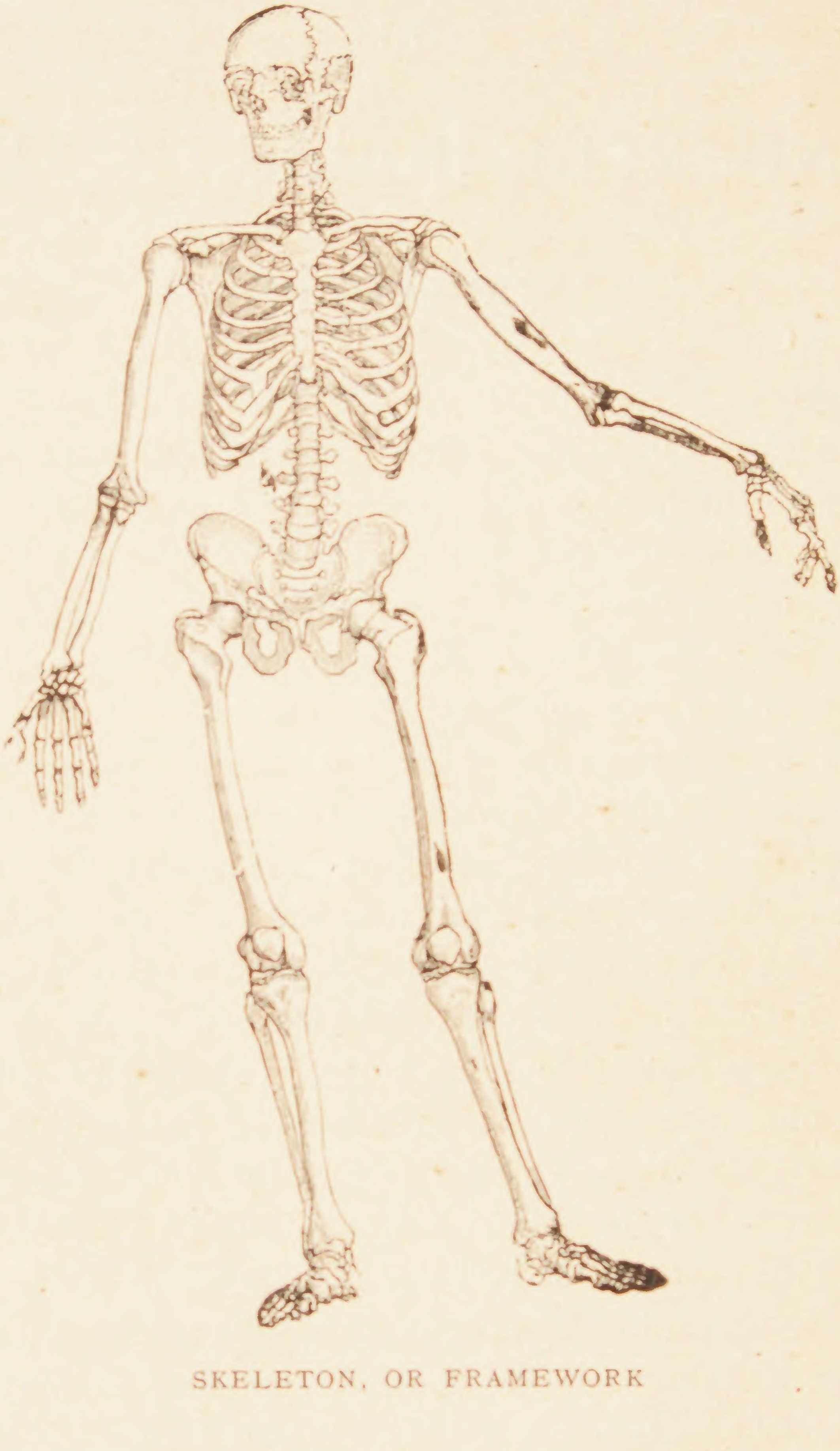
WONDERFUL HOUSE I LIVE IN

INTRODUCTION

THE House I live in is one of the most wonderful buildings in the world. Only one Being could set it up, the great Maker of all things. Every part of it shows His wisdom and goodness. It is, however, only a small house.

In Burma, houses are often built on posts, because the country is sometimes flooded. My house stands on pillars, but these pillars are made so that they can move, so that I may take my house to any place I wish.

My house has only two windows; but these are very bright and clear. They are washed many times a day and are therefore spotlessly clean. At night they are each enclosed between two shutters, which are fastened together without bar or bolt. My house has one front door and two side doors. The front entrance has a pair of folding doors. All persons wishing to speak to me must send their messages by the side doors only. Two guards stand one on each side of the house, like sentinels before a fort. My house has a mill to grind food, and a cistern to supply all parts of the building with water. There are also telegraphic wires, like silver, running through all the rooms in the house, so that I can easily send messages to every part of the building. This remarkable house is my body. My heavenly Father knowing that I should need a place to live in has provided it for me. The body is the soul's abode. It is this which makes it superior to all other houses.



SKELETON, OR FRAMEWORK

An account will now be given of the FRAMEWORK, COVERINGS, APARTMENTS, FURNITURE, REPAIR of the house with hints about keeping it in good order.

THE FRAMEWORK

The framework of my house consists of bones. They are strong and hard to bear its weight. Without bones we could not stand upright or carry any load. They also protect from harm tender parts of the body, like those in the head or breast.

The bones are composed partly of a kind of chunam, and partly of a substance like horn. Place a bone in the fire and the horny part will burn leaving only the chunam. If the bone is put in very strong vinegar the chunam will dissolve, and the horny part will be left in perfect shape. While the former is easily broken the latter may be so bent that a long bone may be tied into a knot. The two parts together make the bones light and strong.

The bones of a child have less chunam than those of older persons. Children often fall, but they get no harm, except perhaps a bruise, whereas an elderly person might break some bone.

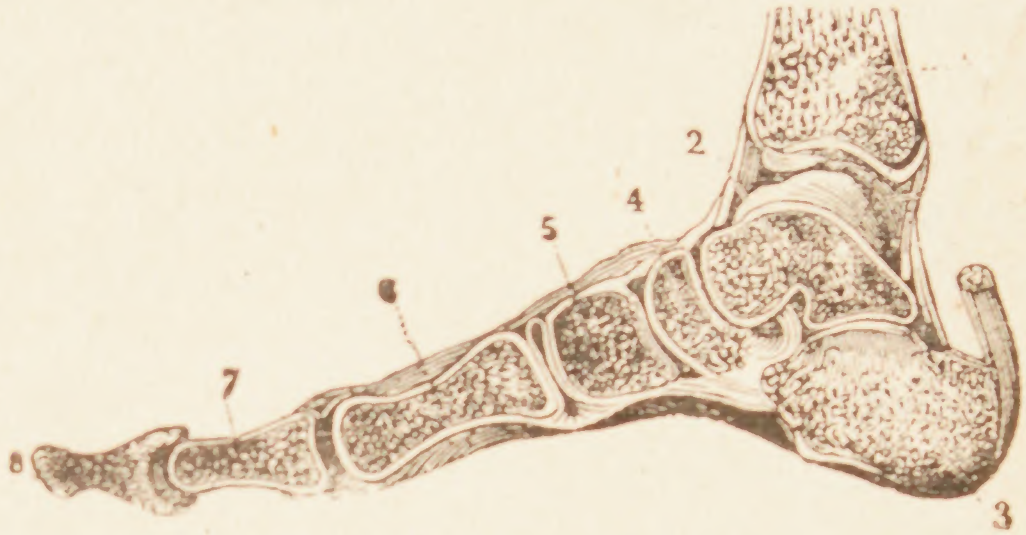
Most bones are not quite solid. They would be too heavy if they were so. Round bones are hollow like the stalks of grain. This makes them strong and light. They have a great many shapes according to their uses. Some are long ; others are flat ; some are round ; some irregular.

The hollow inside the long bones is filled with a soft substance, called marrow. The bones need to be nourished by blood, like other parts of the body, though they do not need so much. Most of the bones have one or more holes through which blood-vessels pass.

When bones are perfectly dry they lose about half their weight. In that state the bones of a man weigh from eight to twelve pounds.

The pillars are the bones of the lower limbs. They are made up of three parts—the thigh, the leg, and the foot. Besides these each knee has little bones.

The thigh bone is the longest in the body. At its upper end, where it is joined to the hip bone, there is a round head which fits into a hollow. The lower end rests on the large bone of the leg. The leg has bones—a large one inside and a small one outside. In front of the knee joint there is a small round flat bone, not joined to the other bones, which is called the knee-pan. It is of great use in bending the limbs.

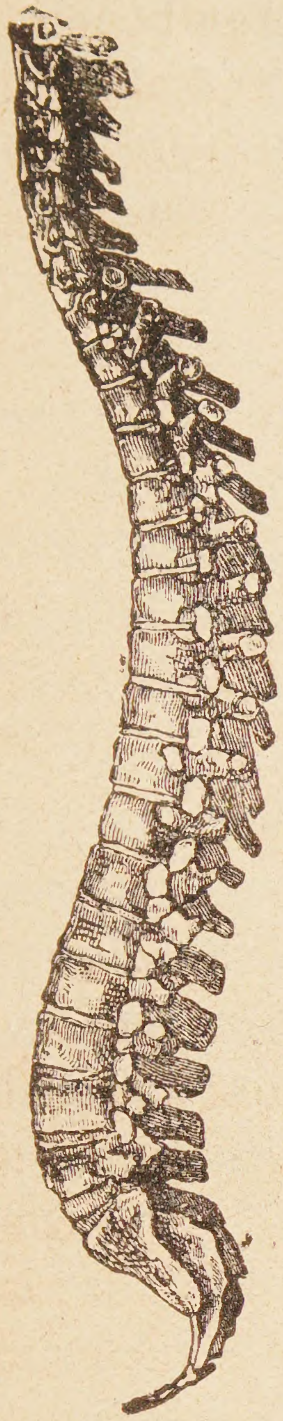


BONES OF THE FOOT

The foot is composed of twenty-six little bones, strongly fastened together. If it consisted of one solid bone it would not yield at all, and would be liable to be broken when we leaped or fell on our feet. The many little bones yield a little and the shock is broken. The foot is long and thus affords firm support to the body. It is also arched to make it stronger and more springy. In leaping we should try to fall upon the forepart of the foot rather than on the heel as it yields more. The bones of the leg have been snapped by a person falling heavily upon the heel. Each limb contains thirty bones, or sixty in both.

The pillars of the house rest upon large strong bones, shaped somewhat like a basin. From these bones also rises the main pillar of the house, called the backbone or spine. The Latin word *spina* means a thorn. It is so called because the points of the bones on the back are felt somewhat like thorns.

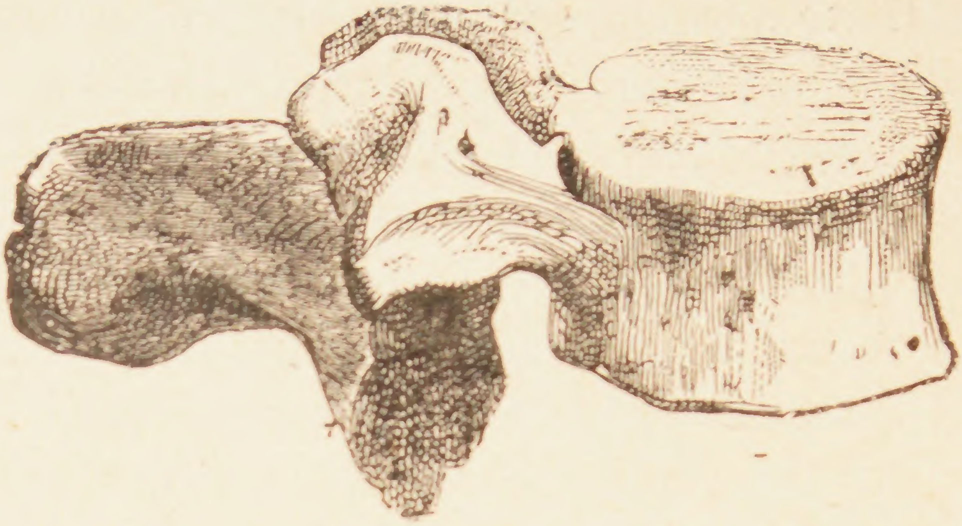
The backbone is composed of twenty-four separate pieces, very firmly fastened together, yet able to move in any direction. The largest and strongest are near the bottom. They gradually get less in size like the trunk of a tree. Each separate bone has a hole in it, so that when the pieces are fitted together they are like one long bone with a canal through the whole length. The use of this is fully explained on page 33.


BACK BONE

Between each bone there is a tough substance like India rubber. This keeps the bones from rubbing against each other, and yet allows them to move freely. People who walk much are a little shorter at night than in the morning, as this tough substance is pressed together. During sleep it springs back again. A backbone in one piece would be liable to break ; if it had only six or eight pieces, the bends would be very sudden. Each of the twenty-four bones is like a joint, enabling the whole to bend easily. Rope-dancers will bend their head back till the spine takes nearly the shape of a bow.

The ribs look somewhat like hoops round a cask. They serve to guard the heart and other delicate parts within. There are twelve of them on each side. One end of each is joined to the spine ; the other to the breast-bone in front. Only seven, however, are joined to the breast-bone itself. The other five are joined to a tough substance, called cartilage, coming down from it. This enables the breast to move more freely in breathing.

The length of the ribs increases from the first to the seventh, which is the longest. They grow shorter again. The twelfth rib is very short.

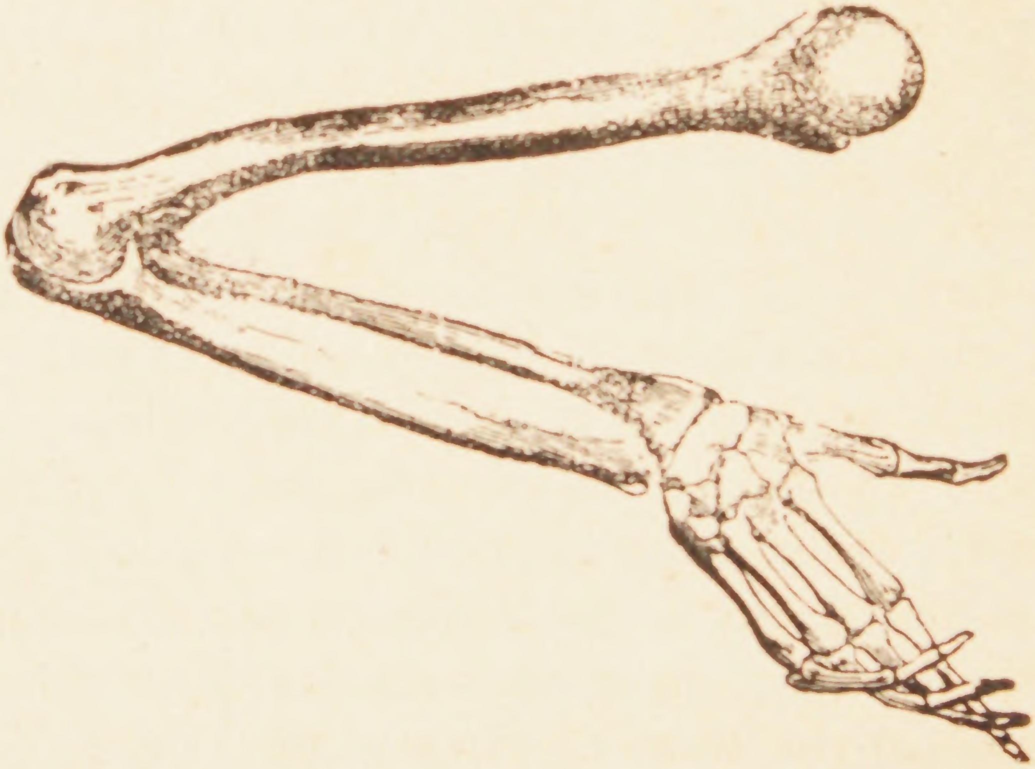


A JOINT OF THE BACKBONE

The collar-bones go from the breast-bone to the broad flat bones, called the shoulder-blades. They are apt to be broken when a person falls upon his arms.

THE GUARDS OF THE HOUSE

The Arms may be called the guards of the house. They are also useful in many other ways. The bones of the arm are somewhat like those of the leg. The upper part consists of only one long round bone. Between the elbow and the hand there are two bones, enabling us to turn the hand in any



BONES OF THE ARM

direction. The larger of the two is called in Latin a word meaning cubit, because the arm below the elbow is about a cubit in length.

The wrist contains eight bones, and the hand nineteen. Each of the fingers has four bones; the thumb has only three. The difference in the length of the fingers serves many useful purposes. The ends of the fingers are the most exposed parts of the hand. The nails help to protect them and enable us to pick up and hold small articles such as pins.

The hand is so wonderful that a whole book by a learned man has been written about it. The shoulder joint moves so freely that we can swing the arm around in all directions, like the trunk of an elephant. The fingers have several joints so that we can bend them or roll them up. The thumb bends in a different direction from the fingers, and enables us to grasp things firmly. The bones and blood-vessels are protected by a soft cushion of flesh.

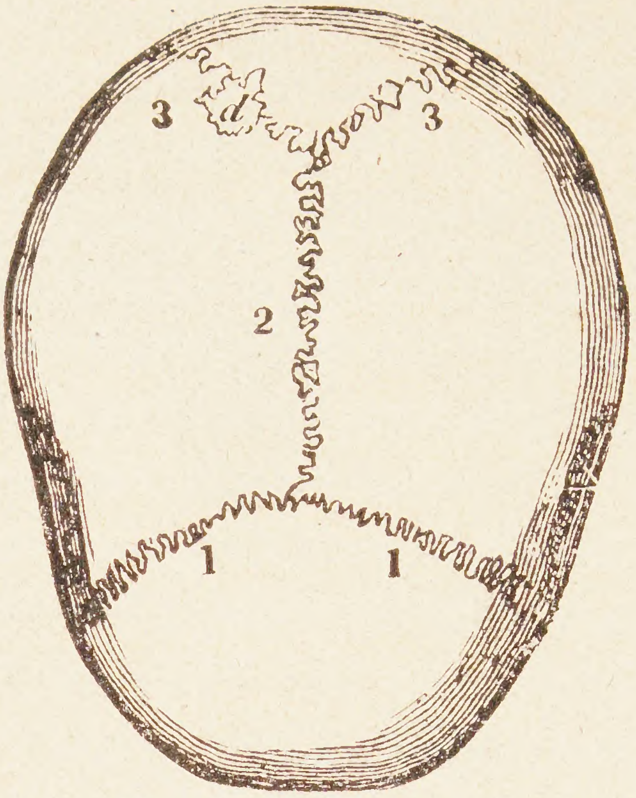
Without hands the farmer could not cultivate, the weaver could not make cloth, the mason could not build houses, the carpenter could not make furniture, the sailor could not guide his ship. Soon we should all die.

What an instrument for good the hand is! What an instrument for evil!

Do not fold your hands idly like the sluggard. He that will not work should not eat. Let your hands never be employed to injure others. Use them well, and 'whatsoever thy hand findeth to do, do it with thy might.'

A dome is a round part of a building at the top, somewhat like a cup in shape. The dome of my house is the head. Here the most precious things are placed and protected as in a strong fort. Here are the windows and doors of the house.

The bones of the head are twenty-two in number, exclusive of the teeth. Of these, eight form the skull, and fourteen



SKULL

the face. The skull is shaped somewhat like an egg laid flat. The bones of the skull fit into each other like the teeth of a saw. In very young children the openings between the bones can be distinctly seen. The bones become closer as age advances. As the joints of these bones have a slight resemblance to writing some people call them the writings of Brahma. They imagine that God has written each person's fate on his head, and that nothing can alter it. This is an idle fancy. We act according to our own free will. When we do wrong it is our own fault.

The skull is formed of several bones to make it stronger like the stones of an arch. Another purpose is to keep it from being so easily hurt by a blow. There are six bones on each side which form the face, and are grouped together under the name of the upper jaw. The lower jaw is one strong bone, shaped somewhat like a horse shoe.

The seven upper bones of the spine form the neck, on which the head rests. The teeth will be described in another section.

Joints. The house I live in differs in some respects from other buildings. An ordinary house is intended to stand firmly.

No part except the doors and windows is made to move. In my house it is otherwise. Some bones it is true, like those of the skull, are joined firmly together, but many of them move freely on joints.

There are different kinds of joints. Some allow movement in only one direction. These are called hinge joints. A door has a hinge joint. It can only open or shut. The knee, the jaw, and the parts of the fingers are joints of this kind.

The most curious joints are what are called the ball and socket joints. A round head fits into a hollow so that it can turn right round. The hip joint, the shoulder, and the thumb are examples.

The head is joined to the top bone of the spine by a hinge joint. With this joint we bend the head forward and backward. The first bone is connected with the second by another hinge, like that of a gate, by which we turn the head from side to side.

There are about one hundred and eighty hinges in the human body. Each kind is best fitted for the place it occupies. If the knee had a ball and socket joint we could not walk firmly.

The bands. How are the joints held in their places? There are strong, tough skins, white and shining, called ligaments (binders), which rise from one bone and clasp the head of the other all round. One bone is exactly fitted to the other, and the ligaments hold the ends of the bones together. The knee had special care taken of it, because of its great importance. It has fourteen strong ligaments which so cross each other that it is almost impossible for the bones to be displaced. Some of the ligaments are narrow; others are broad.

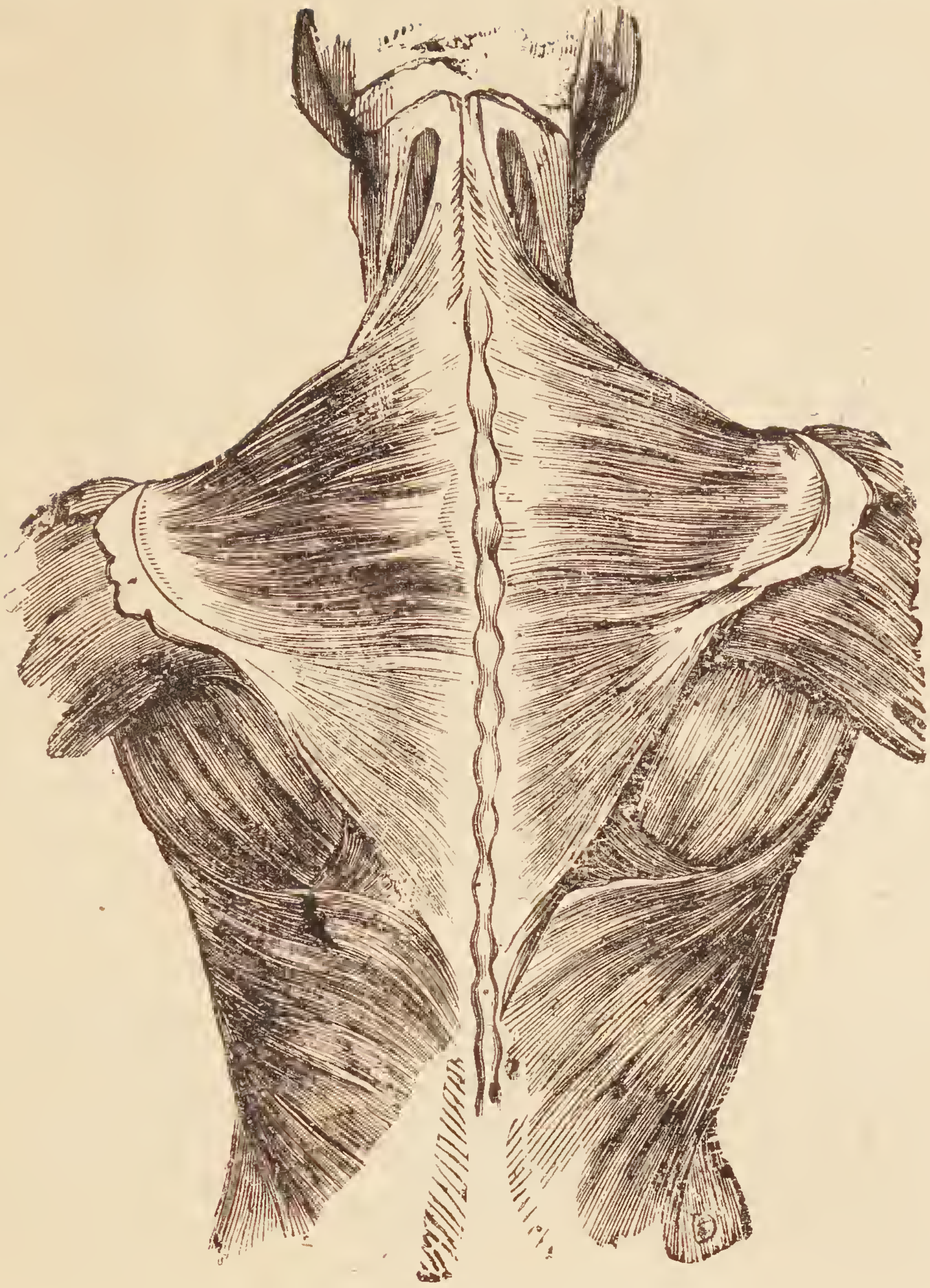
The oiling of the joints. What keeps the joints of the body from wearing out, when we use them so much? If the bones were dry, they would rub against each other, and soon become useless. What is done to prevent the wheel and axle of a carriage from wearing away? They are oiled, and fresh oil must be applied now and then as it is used up. It is the same with the joints. They are made beautifully smooth; but there is a kind of bag around them which gives out a substance which answers the purpose of oil, keeping the joints always soft. Some vessels give out this oil; others take it up when it has become unfit for use. What a wonderful contrivance is this! We have not to oil our joints. The oil is made when it is wanted, and supplied without any help from man.

Number of bones. The head above the neck contains sixty-three bones; the trunk, what is commonly called the body, contains fifty-three bones; the arms and shoulder-blades, sixty-four bones; the lower limbs, sixty. The total number is two-hundred and forty. To these may be added eight very small bones found in the thumbs and great toes of elderly persons. Some make the number about two hundred and sixty, but in this some very small bones are included which are not found in every person. When the bones are fastened to each other by pieces of wire the whole is called a skeleton.

COVERINGS OF THE HOUSE

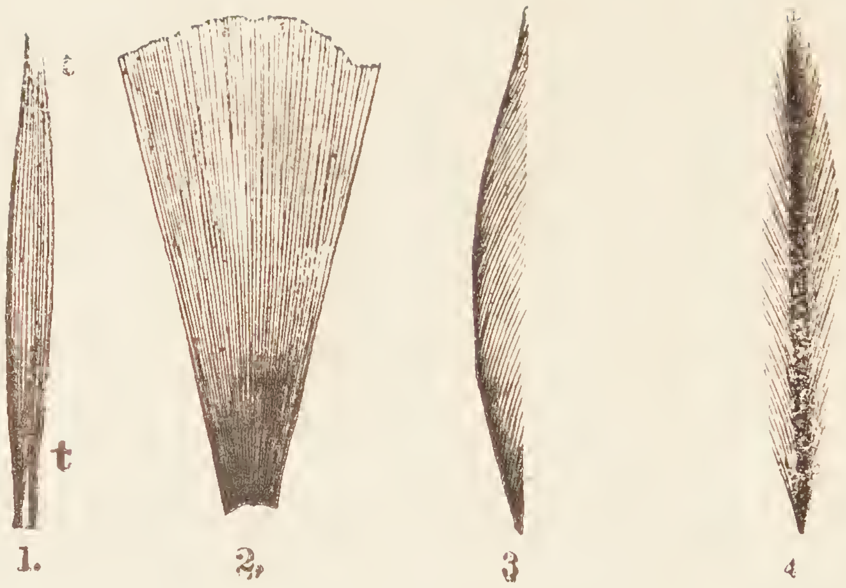
Bone coverings. The house I live in has several coverings. Every bone, except the outer parts of the teeth, is covered with a thin skin. The bones require to be nourished with fresh blood like the other parts of the body. Their skin contains innumerable blood vessels which spread like a network upon the surface of each bone.

Muscles. The muscles are the flesh. Their red colour is caused by the blood which runs through them in all directions. When the muscles are soaked and boiled long enough in



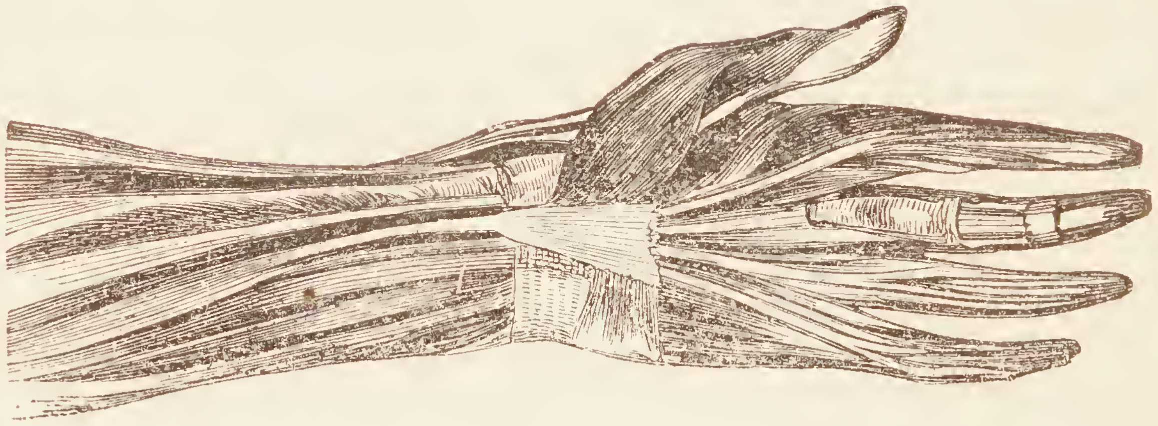
MUSCLES OF THE BACK

water, the redness disappears. The bones are generally smallest in the middle and largest at the ends; but the muscles are generally largest towards the middle and grow smaller towards their ends. The muscles are made up of a number of threads placed together. Each of these threads is made up of a great number of smaller ones. The threads are generally joined together in bundles. The form of the muscles differs. Most of them are long and roundish, as in the forearm; others are flat, as on the breast; some are fan-shaped and some are in the form of a ring. The body contains about five hundred muscles.



SHAPE OF MUSCLES

Some of the muscles are fastened immediately to the bones. In general, however, they end in white flattened substances, called tendons. They are very tough, stronger than leather.



TENDONS OF THE HAND

The chief use of the muscles is to bend the joints. Without them we could not move. The muscles have the power of shortening and lengthening themselves. When the muscle shortens itself it swells and becomes hard. Most of the muscles are placed on the part of the limb above the joint, and fastened to the bone below by a cord which passes over the joint. Those which move the fingers are in the forearm. Tendons from them to the fingers may be seen on the back of the hand. The hinge joints have two sets of muscles, one to bend and one to straighten the limb. The shoulder has muscles to draw it in different ways.

Voluntary and involuntary muscles. There are two kinds of muscles—the voluntary and involuntary. The voluntary act only when we direct them, as those of the arms and legs. The involuntary act without our will, as the heart and some others. They go on when we are asleep as well as when we are awake. Were it not for this we should die.

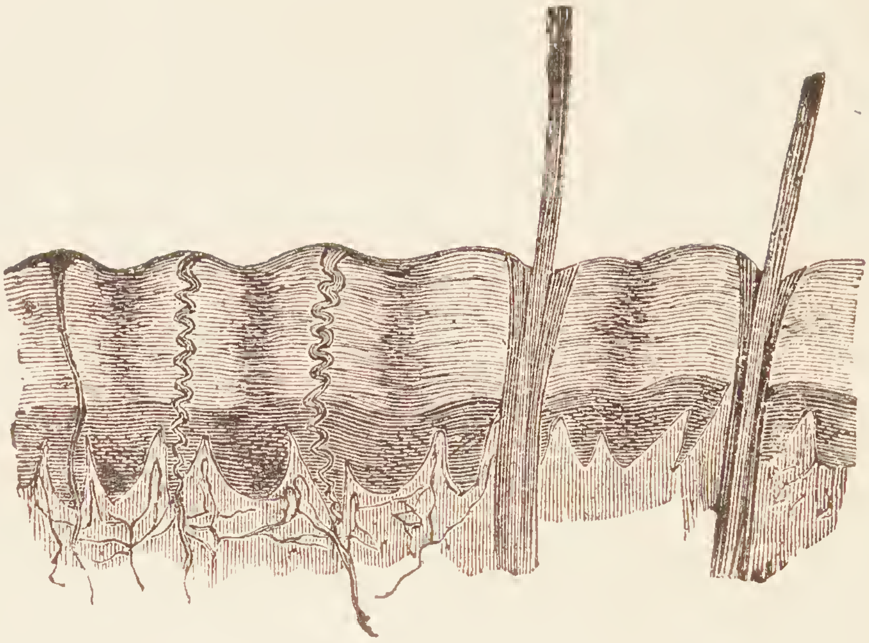
All the movements of the body are caused by the muscles. By means of them we roll the eyes, we laugh and talk. How quickly we move the muscles in guiding the pen in writing! Truly we are fearfully and wonderfully made. The muscles are strengthened by exercise and become weak through disuse. Exercise should be regular and frequent. It is best taken in the open air, and by day rather than when it is dark. Severe exercise should not be taken immediately before or after a full meal.

Fat. Besides the muscles the covering of the house contains more or less fat. This soft white substance is placed between the muscles separately. A small portion only of fat is necessary to health; when it is found in very large quantities, it rather shows disease. Persons who use ghee largely and do not take sufficient exercise become very fat.

The skin. The outside of my house is covered evenly over with a soft shining coat, which is called the skin. It helps to protect all the inward parts, while it is so sensitive that a fly cannot alight anywhere on it without my knowledge. We are not covered with wool like sheep or with feathers like birds. Although these would be comfortable in a cold climate, they would be oppressive where it is hot. We have only a thin skin, but we have reason and hands, enabling us to clothe ourselves in a way suited to the country in which we live.

Outer and inner skin. The skin is made up of two layers. The outer skin, called the cuticle (little skin), helps

ROJA MUTHIAH
47, HOSPITAL STREET
KOTTAIYUR-623 106



MAGNIFIED VIEW OF THE SKIN

to protect the parts below. It can be seen when it is raised in a blister. It feels no pain when it is cut or torn. It is constantly growing from below, while the outer parts fall off in small scales. It is thickened and hardened by work, as in the hands and feet of labouring people. The nails are formed of the same substance as the outer skin.

The seat of colour lies between the cuticle and the true skin. It differs in different races of men, and in different persons. It is white in Europeans, yellow in the Chinese, copper-coloured in American-Indians, and black in Negroes. It is much affected by exposure to the sun, so that a person becomes dark by living in the open air, and pale by keeping in the shade. No one should be despised on account of his colour.

The inner or true skin is thick and soft, lying between the cuticle and the flesh. It is the seat of the sense of touch; water to cleanse the body, and oil which makes the skin soft, are prepared in it.

Nerves. We feel by means of very small white threads, called nerves, which come from the brain. They are found in the greatest number at the ends of the fingers in slight ridges of the skin. The skin is also very fully supplied with blood-vessels. The nerves and blood-vessels of the skin are so numerous, that if we are pricked anywhere with the point of a needle, a nerve has been hurt and a wound has been given to a blood-vessel.

Waste matter. The skin is full of little drains to carry off waste matter from the body. In some parts a rupee would cover 3,000 of them. To cause the waste matter to flow out, there is water constantly passing through the drains. When we are very hot, the water runs out in larger quantities, and gathers on the skin in drops which we call perspiration, or sweat. As much water passes through the skin of a man in a day as would fill an ordinary bottle. The water carries off with it about the weight of half a rupee of poisonous waste matter.

The mouths of these little drains are kept open by washing the skin. Dirt chokes them and the waste matter cannot get out properly. Itch and other diseases often follow. We should bathe every day, if possible, and in clean water. The flow through the drains may also be stopped by a person sitting down in a cooling breeze when he is hot. He is then said to take cold, which may affect him in different ways. Before he can be cured, the passage of the perspiration must be restored.

The skin likewise prepares and sends out a kind of oily matter which makes it soft and supple. The little oil bags are very numerous about the roots of the hair.

Hair. This is found on all parts of the body except the palms of the hands and the soles of the feet; but it is most abundant upon the head. Hairs have little roots in the true skin, and are supplied with blood-vessels to give them nourishment. Dark-skinned persons have generally dark hair, while the hair of fair persons is generally light. Some nations have straight flowing hair; that of others is curly. The Chinese have scanty beards, while the Ainos of Japan have hair growing down the back.

The hair serves to protect the head both against blows and cold. It should be kept clean.

Clothing. Many people die because their dress is not sufficiently warm during the cold season. A cold wind blows upon them, and they are attacked by fever. A flannel undercoat is a great protection. Several folds of cloth around the stomach, especially at night, are a safeguard against cholera. Special care is needed when hot and cold days follow each other and when the days are hot and the nights cold.

Children feel the cold more quickly than grown-up people; but often they are allowed to go about quite naked like beasts. This causes many deaths among them. Even modesty requires that they should have some covering.

Clothing should be kept clean. Waste matter from the body sticks to the dress, pillows, and to all that touches the body. If rubbed against the skin, it goes into it and injures the health.

THE REPAIR OF THE HOUSE

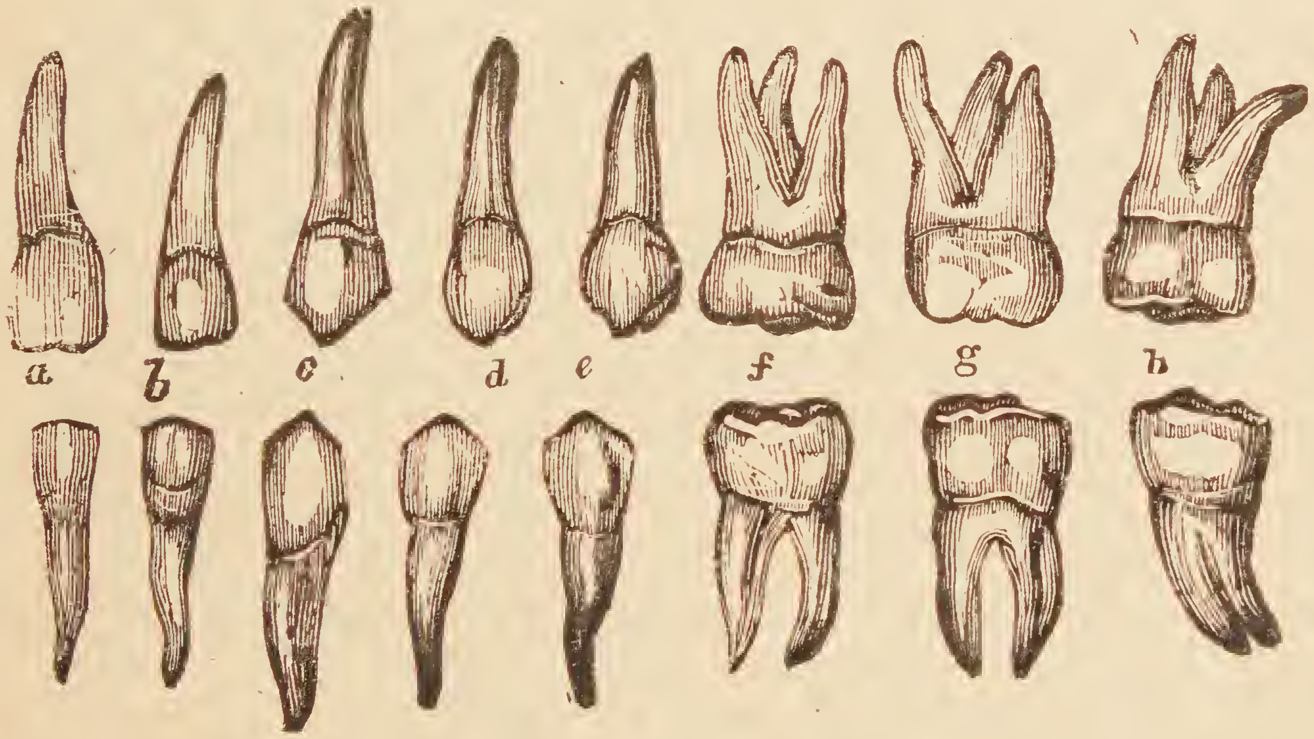
My house, like all other houses, is liable to waste and decay; but in one respect it differs from them. Other houses are repaired by external help: my house repairs itself. The machines which we make cannot be repaired while they are in use. It is not so with my house. Repairing is going on while it is in use, every day, every hour, every moment. The body is continually changing. The way in which my house is repaired will now be described.

Why we eat. If we had no food our bodies would get thinner and thinner till we died. Where does the flesh go to? A stone image does not grow less and less if not fed. The reason is that we work, while the image does not. Every word we speak, every step we take, wastes a little of our body.

The waste is made up by our food. We take into our body as much as we waste. Growing children take in more. Besides giving us strength our food warms us. It burns within our breast like a little fire though it does not break out into a flame. There is as much heat produced in the body every day as would boil a large pot of water.

Teeth. Many houses in India have stones for grinding grain into flour. My house is also provided with grinders—the teeth. The new-born infant has no teeth, for they are not needed, and would be in the way. As the child grows, little white teeth begin to appear, first the front teeth, then the side teeth, and lastly the back teeth.

The first set of teeth, twenty in number, are small and fitted to the size of the jaw. They drop out about the seventh year and are replaced by the permanent teeth, which are larger and are thirty-two in number. The four hindermost do not appear till adult age.



The teeth are of different shapes. The front teeth are sharp to cut the food. The next teeth are pointed, like those of the dog. They are useful for tearing tough kinds of food. Next are teeth having two points. Lastly there are the grinders.

They have uneven surfaces which enable them to grind much better than if they were smooth. The large grinding teeth of the upper jaw have three roots each to hold them firm in the head, as they hang; while those of the lower jaw have each but two roots, as they stand upright.

SECTION OF TEETH

The picture shows the appearance of a tooth when cut through the middle. The body of the tooth is composed of bone. The part which rises above the gums is covered with a very hard smooth coating, called enamel, to keep the tooth from wasting. Each tooth has blood vessels to nourish it, and nerves of feeling which go through a little hole at the bottom of each tooth. The nerve when exposed or inflamed gives rise to the distressing pain called tooth-ache.

In eating the upper grinders remain still and the lower move up and down. There is also some motion from side to side which is best seen in the cow.

To preserve the teeth they should be kept clean. Any little bits of food left sticking between the teeth eat into them as rust eats into iron. Food or drink should not be taken into the mouth when very hot or very cold.

Saliva. The food cannot be chewed properly unless it is well mixed with a fluid, called saliva, the spittle. When the mouth is dry, it is impossible to eat. Therefore little glands,[1] placed in the cheeks and under the tongue, which pour out saliva as it is wanted. When we are not eating the saliva comes only in small quantities; but when we begin to eat much more is poured out. Even the sight of tasty food sometimes makes the mouth water. We should eat slowly and chew our food well that it may digest easily.

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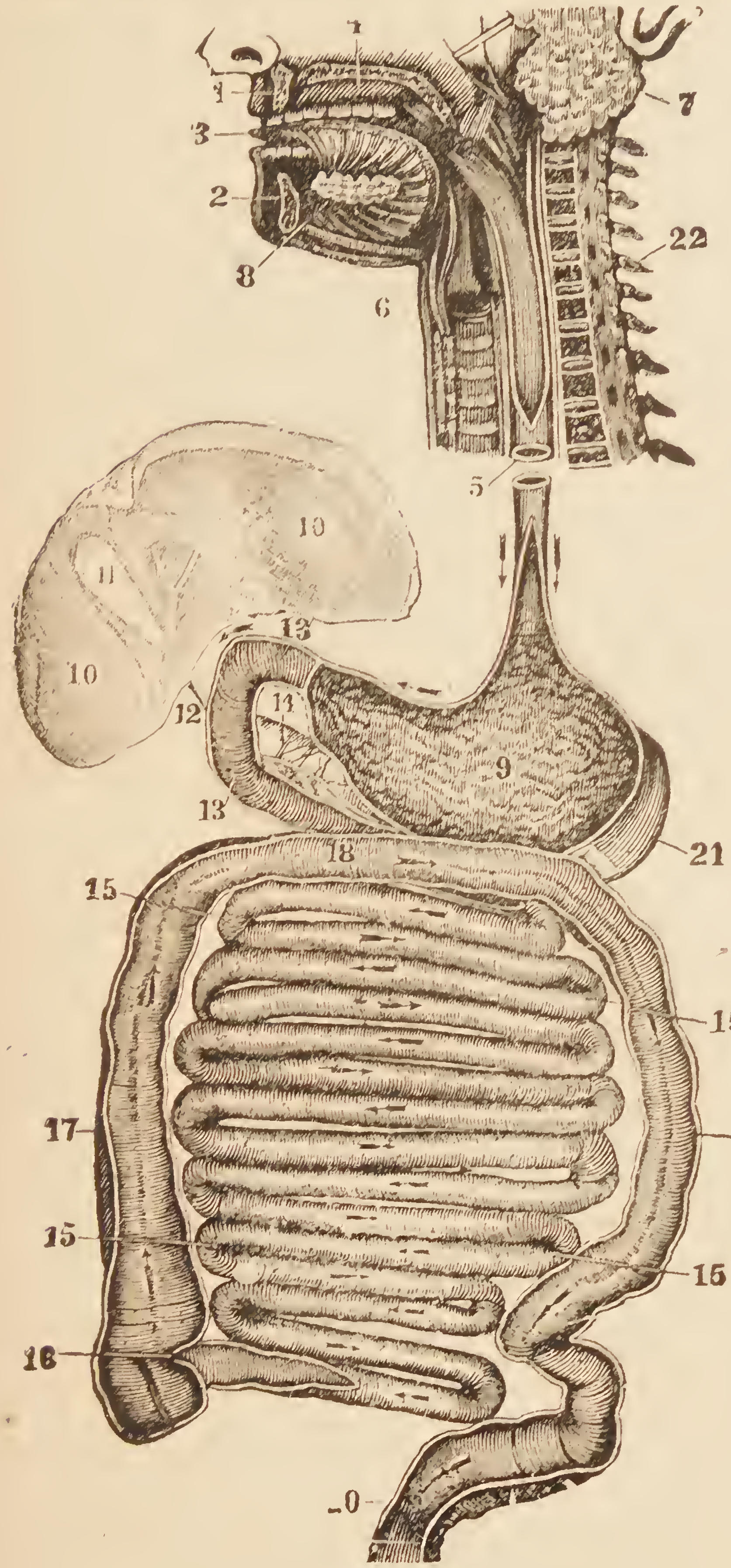
[1] A gland is a fleshy part of the body, which gives out some substance as saliva or bile.

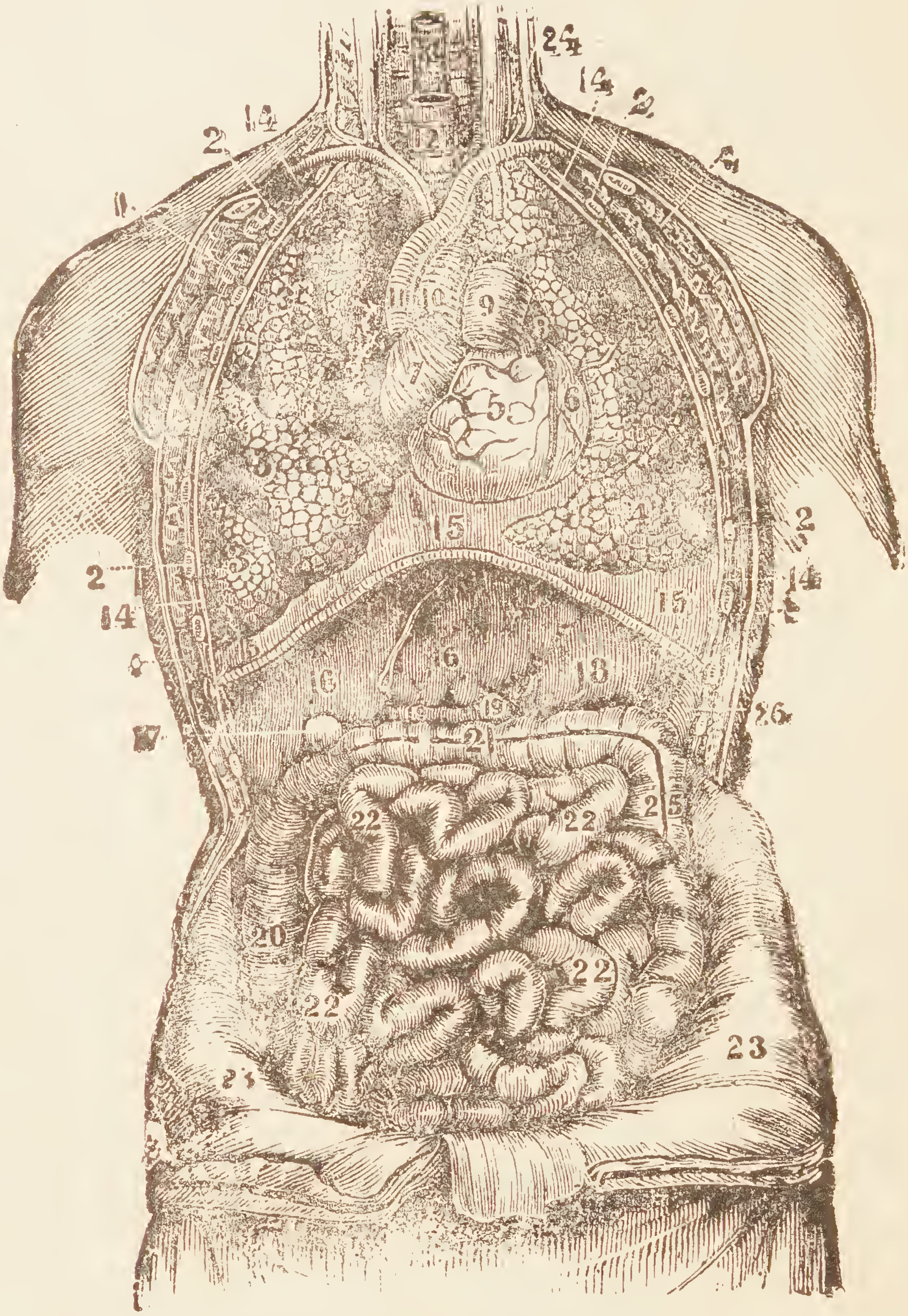


COURSE OF THE FOOD

3. The Tongue. 5. The Gullet. 9. The Stomach. 10. The Liver. 11. The Gall-bladder. 14. The Pancreas. 21. The Spleen. 15—20. Intestines.

Swallowing food. The food passes down into the stomach through the gullet. The food does not drop down by its own weight, but is pushed along by the gullet, somewhat like a worm when it is crawling.

The Stomach. The stomach looks somewhat like a leather bag with two openings, one for the food to come in, and the other for it to go out. Before our food can nourish us it must be changed into blood. This change begins in the stomach. As soon as the food enters it the stomach produces what is called the gastric juice, just as the mouth pours out saliva. The gastric juice has the power of dissolving most kinds of food, and changing its colour; this is called chyme. Unripe fruit and some other things dissolve slowly and should not be eaten. If food is not properly chewed it takes longer to dissolve.



PART OF THE FURNITURE OF THE HOUSE

3. The right Lung. 4. The left Lung. 5, 6, 7, 8. The Heart. 9. The Artery to the Lungs. 10. The Aorta. 11. The descending Veins. 12. The Windpipe. 13. The Gullet. 15. The Diaphragm. 16. The Liver. 17. The Gall-bladder. 18. The Stomach. 26. The Spleen. 20. 21, 22. The Intestines. 24. The passage where the Chyle enters the vein.

It would be hurtful for the food to pass into the bowels before it is digested. To guard against this, there is a kind of door at the opening, called pylorus (doorkeeper), which sends back any food not properly digested, and allows only the chyme to pass. What a wonderful contrivance!

When a woman is boiling rice she puts it all in the pot at once. If she kept throwing in rice now and then, it would be badly cooked. It is the same with our food. We should eat only at fixed hours, and the stomach should have time to digest one meal before another is taken.

Some kinds of food digest much quicker than others. Rice takes about an hour; dal takes longer; mutton about three hours; and pork about four hours.

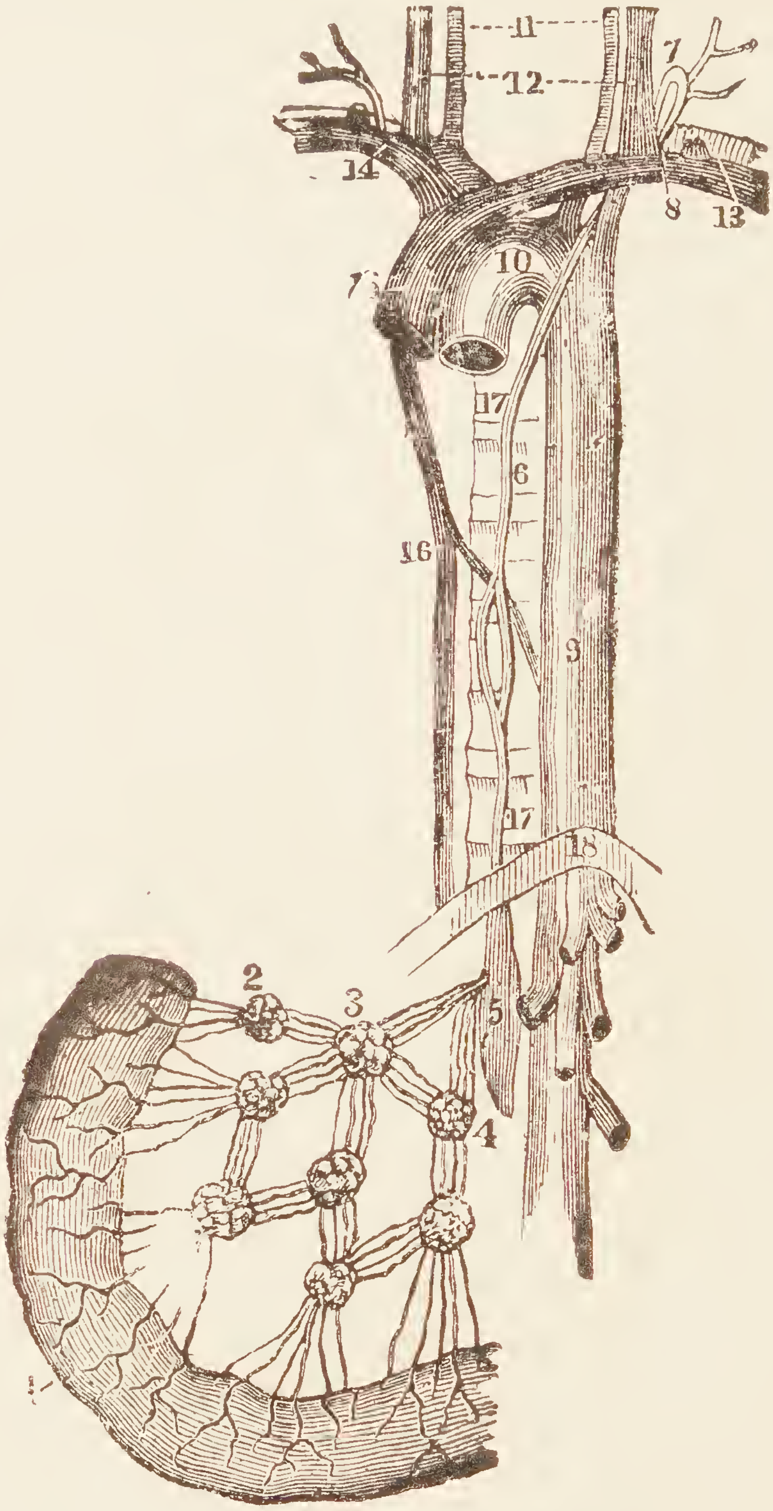
Separating the nourishing part from the chyme. When the chyme passes through the doorkeeper of the stomach, it enters the bowel, a pipe about eighteen cubits in length in a full grown person. The bowel is folded, as you see in the picture, to take up as small a space as possible.

The bowel has the worm-like motion of the gullet to push along the chyme. As the chyme passes three fluids are mixed with it. The liver, the largest gland of the body, lies on the right side below the right lung. It gives out bile, or gall, which is of a yellow colour and very bitter. The bile is stored in the gall-bladder till it is needed. It is poured into the intestine, but in the disease called jaundice it gets mixed with the blood, and the person has a yellow look. The pancreas, just below the stomach, gives out a fluid somewhat like saliva. The bowels themselves also give out another fluid.

These three fluids help to dissolve the food, and to separate from the chyme the nourishing part called chyle. The chyle, which is like milk, is collected by the lacteals (milk vessels) and poured into a large vein in the neck. The useless part of the food expelled.

ROJA MUTHIAH
47, HOSPITAL STREET
KOTTAIYUR-623 108
P. M. DIST-INDIA

When a house is swept the rubbish is thrown out. It would be unhealthy to keep it inside. So the refuse of my house should be discharged every day at regular times.



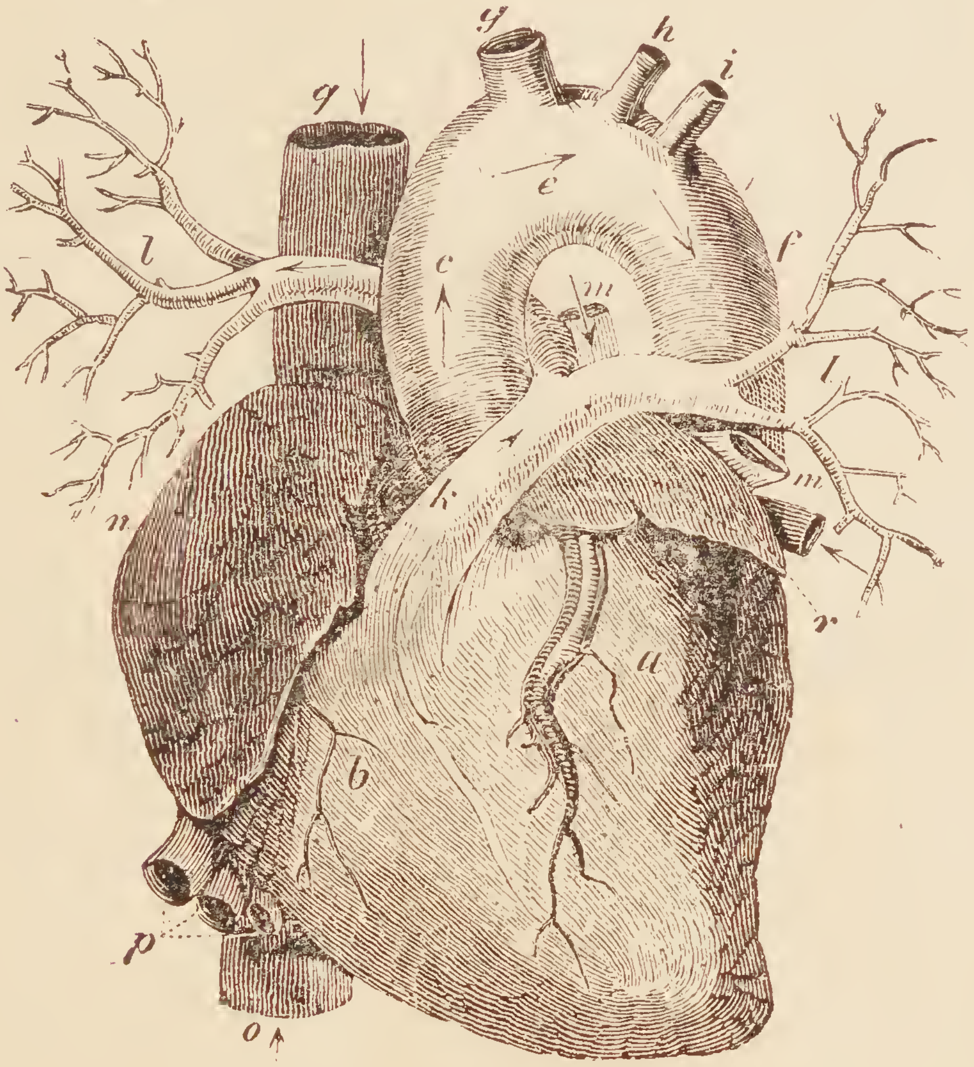
PASSAGE OF THE CHYLE TO THE NECK

HOW THE CHYLE IS CHANGED INTO BLOOD

The white chyle mixes with the blood and is sent by the veins into the heart.

The blood consists of a great number of little, flat, round particles like pieces of money floating in nearly colourless fluid. These particles give the red colour to the blood. They contain iron and some other substances. A man once had a small iron ring made from his own blood.

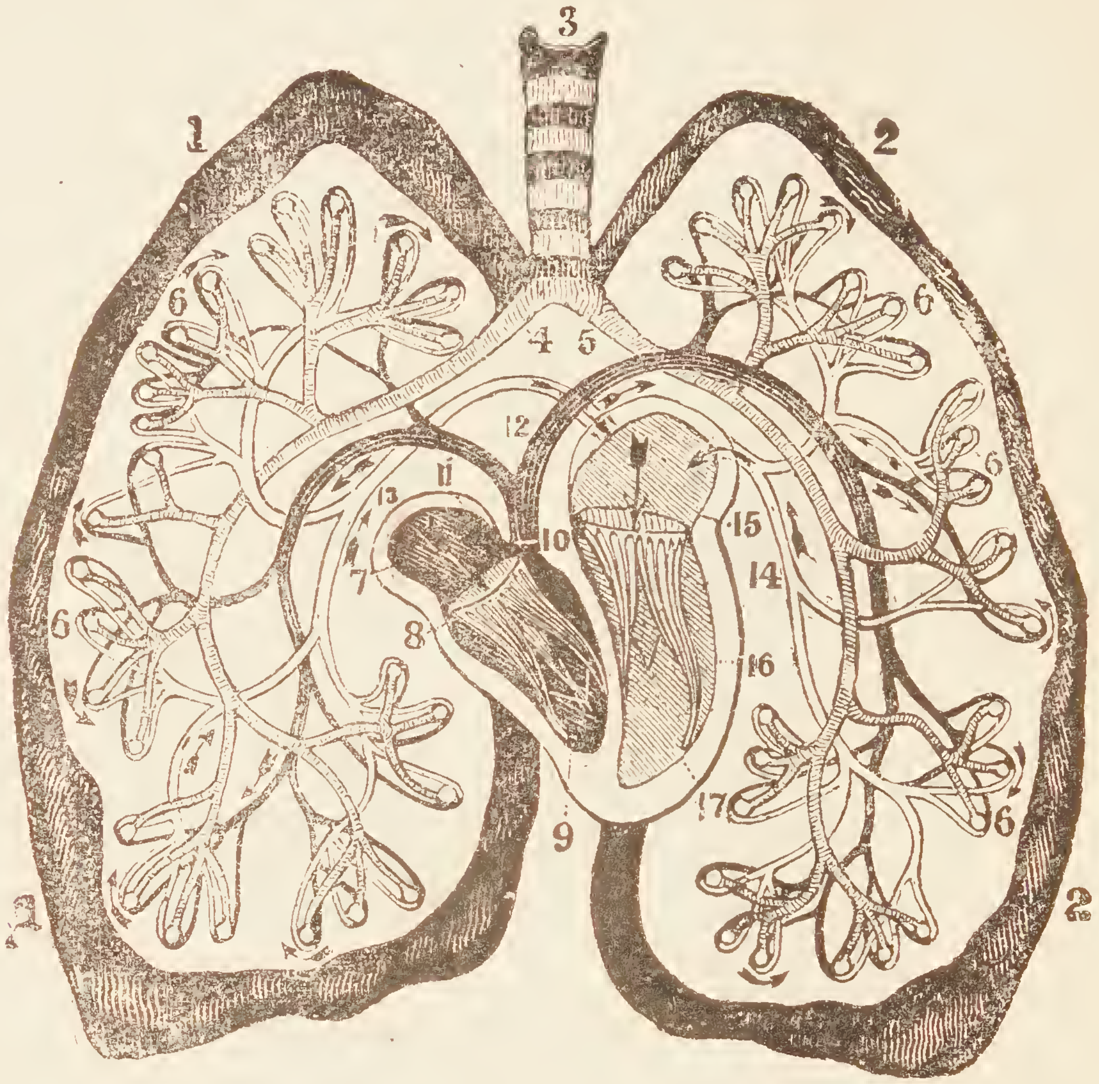
The spleen lies to the left side of the stomach. After attacks of fever it sometimes becomes so large that it can be seen sticking out. It is then easily ruptured. A slight blow may cause death. The use of the spleen was long unknown. It is now supposed to be the part of the body where the particles of the blood are formed.



THE HEART

The heart is placed to the left of the lower-part of the breast-bone. It is a little larger than a person's hand when closed, and is composed of fibres which contract like a worm and press out what is contained in it.

The heart has four hollow places in it, two on each side. When the red blood passes through the body gathering up impurities, it becomes dark. This dark blood mixed with chyle is sent to the heart. From the upper hollow it passes through a door into the lower opening. The door shuts, and when the heart contracts the blood is forced into the lungs.



THE HEART AND LUNGS

The lungs on each side of the heart fill up a large part of the chest. They are somewhat like a sponge, full of small air-cells. It is in these air-cells that the air changes the dark blood to red. The air does not mix with the blood, but the skin of the air-cells is so thin that the air acts through it.

The air is made up mainly of two gases, one of which is called oxygen. It is on this part of the air that life chiefly depends. The oxygen in the air-cells of the lungs takes away the waste matter from the dark blood, and makes it red and clean. The air and watery vapour which we breathe out are impure, like water after washing out a dirty pot.

The air goes down into the lungs and out again through the windpipe which lies in front of the gullet. To keep food from going into the windpipe, there is a kind of little door which covers it when we swallow food. If any particle of food falls into the windpipe, the lungs contract and force the air through the passage to drive it out. This is coughing.

The blood, after it has been purified in the lungs, is sent back to the other side of the heart, from which it is forced through the arteries to all parts of the body.

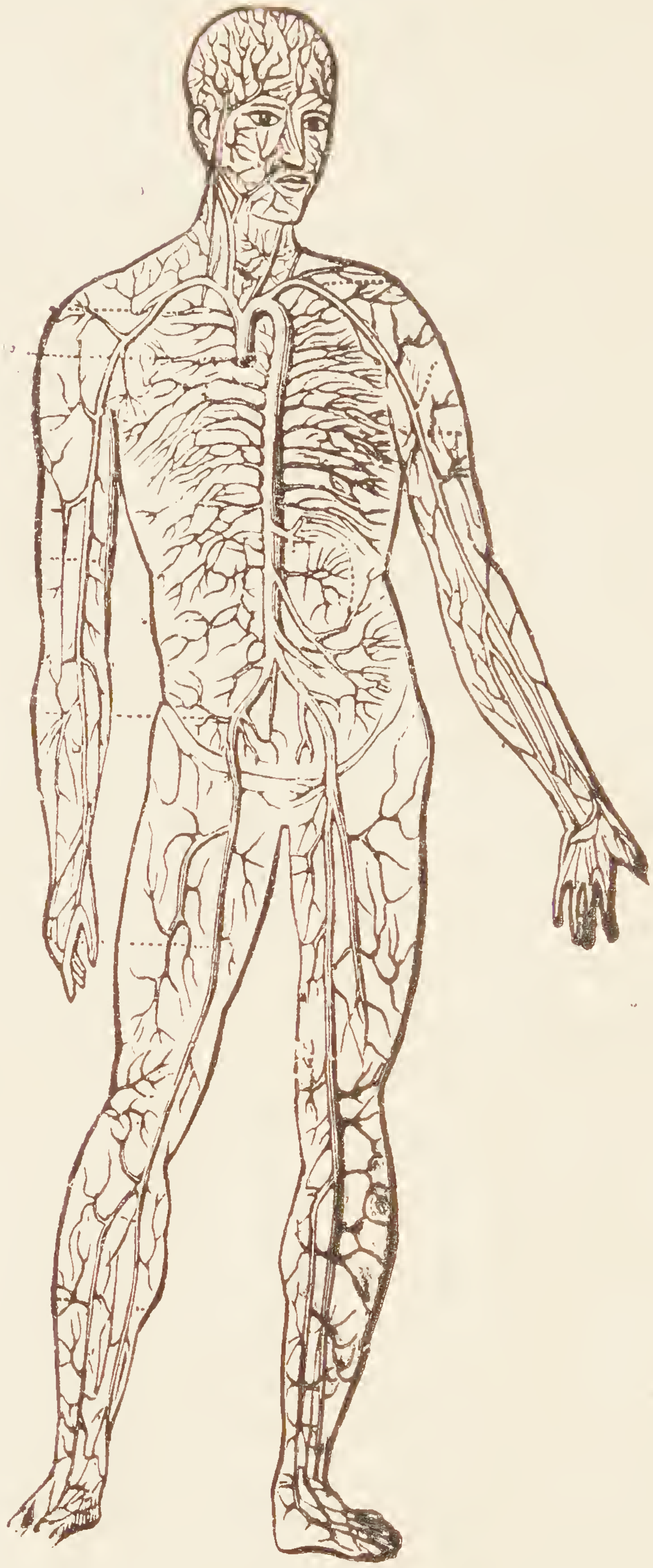
There are two sets of pipes which take the blood all round the body. They are called arteries and veins. The word arteries means air pipes, because the ancients thought that they contained only air. They are empty at death as the heart had not force to fill them with blood. The arteries are composed of three layers of different kinds of skin. They are strong and elastic like India rubber. It is because the arteries are so elastic that they help the blood to circulate.

There is one great artery that rises up from the heart, called the aorta (rising up). It divides into smaller arteries, just as the trunk of a tree separates into branches and twigs. The arteries become at last smaller than the finest hair, and go to every part of the body.

Every time the heart beats, it sends some blood through the arteries, which first stretch out to receive it, and then squeeze together, forcing the blood onward. Most of the arteries lie deep for protection. If they are wounded, the blood flows quickly through them. The beating of one artery can be felt on the under side of the wrist, on the thumb side. Press your fingers on it and you will feel it beating. This is called the pulse.

When we are in health the pulse beats about seventy times in a minute. In some kinds of illness, as in fever, it beats faster. A doctor by feeling the pulse can often tell what is the matter with us when we are ill.

The little hair-like ends of the arteries join on to the little hair-like ends of the veins. The blood flows through the veins which increase in size till they end in one large one which enters the heart.

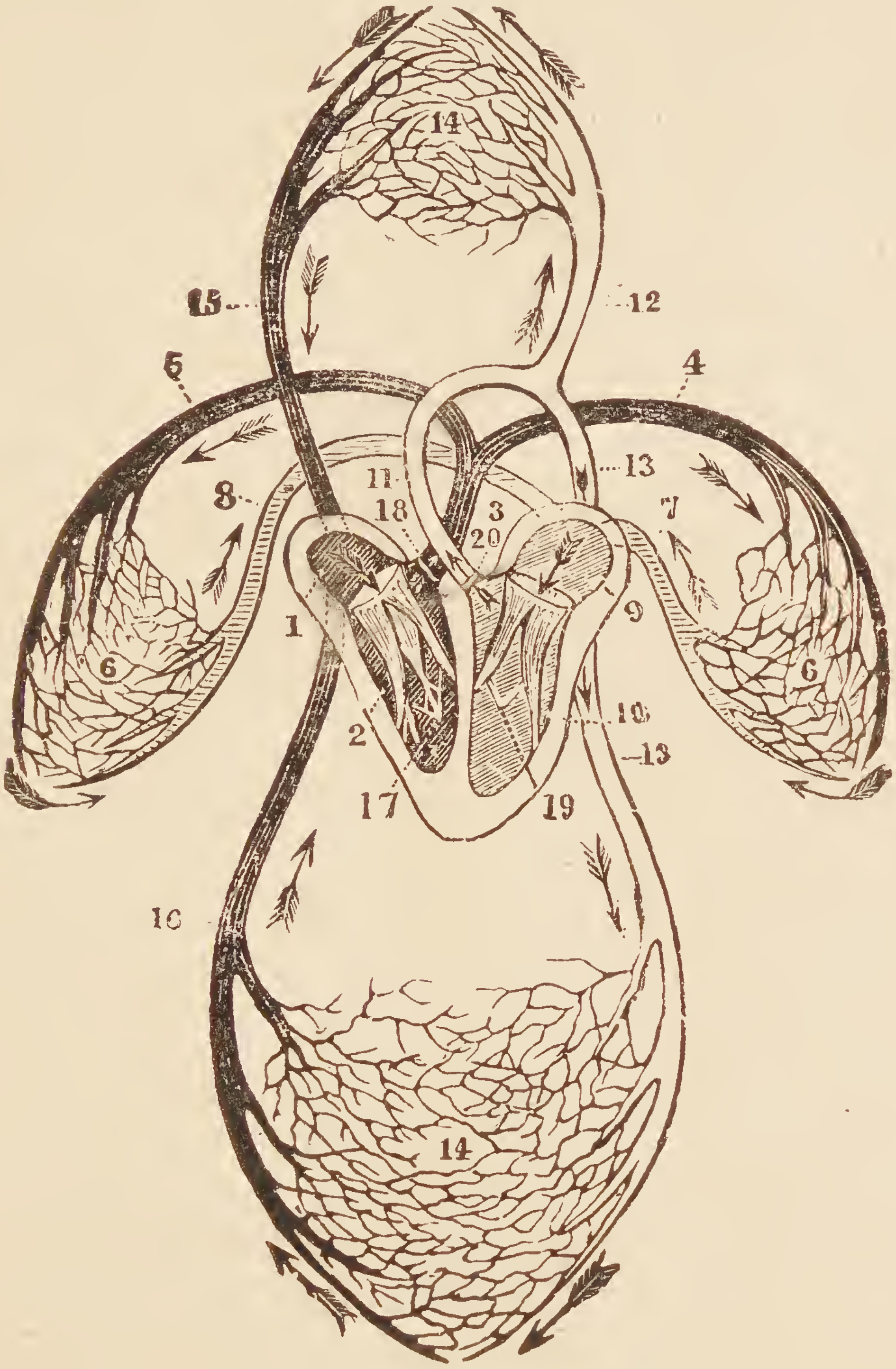


THE AORTA AND ITS BRANCHES

The veins, unlike the arteries, are often near the surface of the body. They can be seen distinctly on the back of the hand. The blood flows much more slowly through them than through the arteries, and if they are wounded the blood flows less freely.

VEINS OF HAND

The flowing of the blood, first to the lungs and then all over the body is called the circulation of the blood. It was found out by an Englishman named Harvey nearly 300 years ago.



CIRCULATION OF BLOOD

What the blood does. The blood in its course gives fresh nourishment to the body and carries away the waste matter.

It is like putting wood on a fire, and removing the ashes at the same time.

Every part of the body is made from the blood. To the flesh of the blood gives what produces flesh; to the skin what produces skin; to the bone what produces bone. The white coat of the eye-ball, the clear window in front of the eye, and the tears which flow from it are made from the blood. So is the wax in your ears. The arteries and veins in which the blood runs are themselves made from blood.

How to keep the blood pure. We can live for several days without food or water; but without air we die in a few minutes. The first thing we do when we come into the world is to take in air, and the last thing we do is to give out air. From our birth to our death, awake or asleep, we are constantly breathing. Air is, therefore, what is most needed to keep us alive.

Everybody knows that we need air, but many think that any air will do. As well might people think that any water will do to drink. It is as hurtful to breathe impure air as it would be to drink water out of a filthy ditch. There are many kinds of poison in the world, but perhaps the poison which kills most people is bad air. Nearly one in four of all the Muhammadan children born in Calcutta die within fifteen days of birth from bad air. Many persons are weak and sickly all their lives from the same cause.

It has been mentioned that it is the oxygen in the air that sustains life. If the air we breathe has too little oxygen, the blood is not properly purified, and the body becomes feeble.

The air we give out is different from the air we take in. It has cleansed our bodies and become impure. If there are several persons in a close room, each giving out bad air, the good air in the room must soon be used up. Cattle, goats, dogs, and other animals breathe as we do, and spoil air in the same way.

The want of fresh air is chiefly felt in houses built of brick and plastered with chunam. Many houses of this kind have only a few small windows which are carefully closed at night. Some rooms, especially those in women's quarters, have no windows—only a small door. The air which has been spoiled by the sleepers cannot escape and fills the room. All rooms should have some opening below to let in fresh air and some opening above to allow foul air to escape.

It is a bad custom to wrap clothes over the head and face at night. The same air is breathed over and over again. It is allowable only when the weather is very cold and our clothing is insufficient.

Besides having plenty of air outside we must allow it to come into our bodies in sufficient quantities. In writing or working we should not bend over, squeezing the lungs, and hindering the air from getting in. Learn to sit and walk upright, and do not stoop. Hindus often refuse to drink water from a vessel which another person has touched with his lips; but when they crowd together in close rooms, they drink in, again and again, the bad air and foul matter which come out of each other's lungs.

Sick people spoil the air much faster than those who are well. They therefore need a larger supply of pure air. Filth and decaying matter should not be allowed to pollute the air near us. It is especially hurtful for it to get into drinking water. Some of the worst kinds of fever are thus caused.

Exercise. Some poor people in this country are overworked; but the rich often suffer from want of exercise. A European gentleman generally walks or rides every day for health; a rich Indian, as a rule, stays at home, and does not go out unless he is obliged.

When we are at rest we breathe about eighteen times a minute. When we walk or run we breathe faster and take in more air. Thus the blood is better purified. The heart also moves faster and more blood is sent to all parts of the body for their nourishment. We can, likewise, take more food after exercise, and digest it better.

Children everywhere are fond of play. It is good for them. While some boys neglect their lessons for their sports others get too little exercise. Young men preparing for university examinations are the most liable to suffer in this way. Some think that all their time should be spent in study. This is a mistake. The mind works through the brain. By exercise the brain receives a larger supply of blood, and is strengthened. Many Indians who have distinguished themselves have died when comparatively young from want of exercise.

Sleep. When we have been working during the day we get tired at night. Both the body and mind need rest. Whatever we do causes some waste of the body. It is during sleep that this waste is chiefly made up. When people draw all day from a well the water gets low, but at night more gathers. After a good night's rest we rise next morning quite like new people. To be strong and healthy we need sufficient sleep.

Poor people sometimes get too little sleep; rich people often lie too long in bed. Children need more sleep than grown-up people. Some people need much sleep; others comparatively little. Night is the best time to sleep. Go to bed not later than ten o'clock, and rise early. Sleeping on beds is better than sleeping on the floor. It helps to protect a person from fever, rheumatism, and snakes.

A full meal should not be taken immediately before going to bed. It is apt to make people sleep heavily, and have bad dreams. Dreams are only idle fancies passing through the mind and do not mean anything.

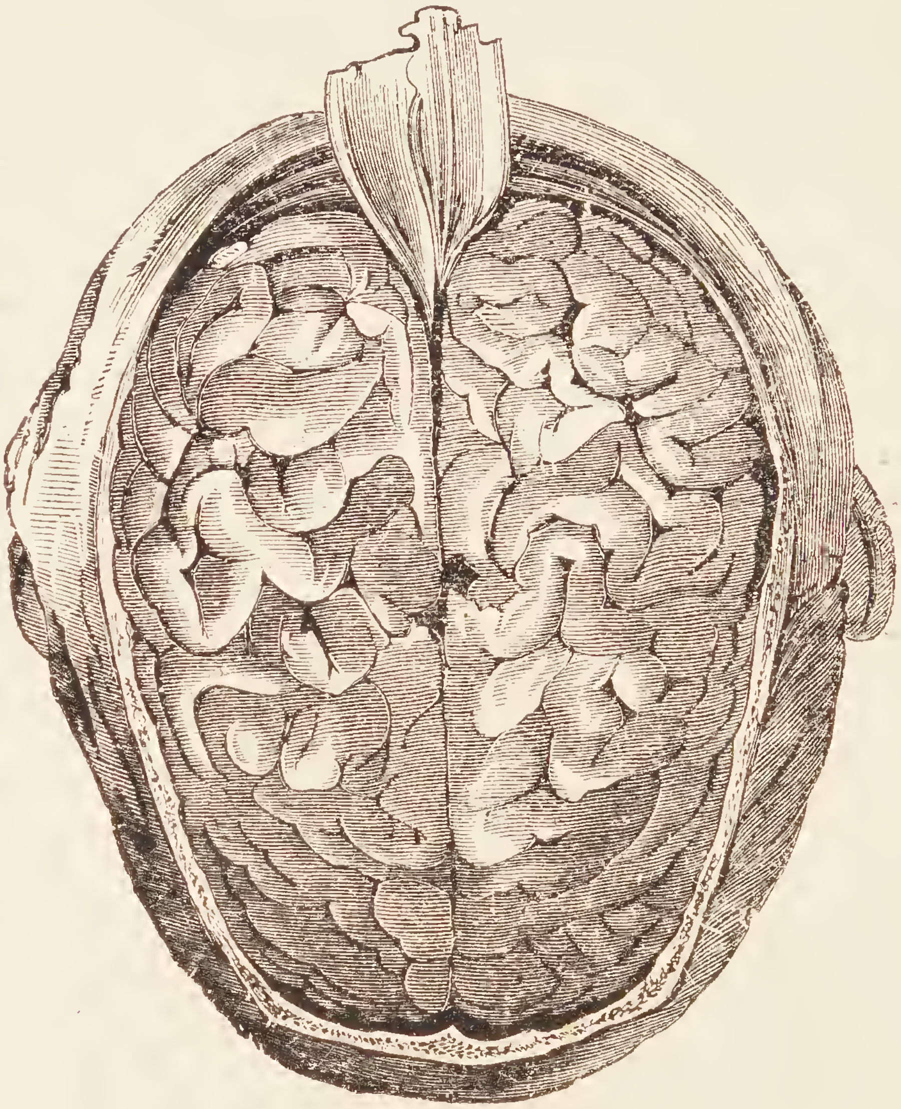
In some parts of the country, during the hot season, people sleep in the open air without harm. But when there is any quantity of dew, it is injurious, because it causes fever. In such a case there should always be some shelter over head.

THE TELEGRAPH OFFICE

Cities like Calcutta, Bombay, and Madras, have each a telegraph office, from which wires branch off in different directions. By means of electricity messages can be sent along the wires to the principal places in the country. The house I live in has also its telegraph office, situated in the dome. It is called the brain.

The brain itself is the softest part of my house. It is therefore well protected, first by the strong bones of the skull, and then by being enclosed in three skins. The picture of the previous page shows the appearance of the brain when the upper part of the skull is removed. The one on the next page shows how it looks from above.

The outside of the brain is composed of soft grey matter, curiously folded; white matter of a similar character is within. The brain is divided into two halves by a deep cleft and each of these again into several parts.



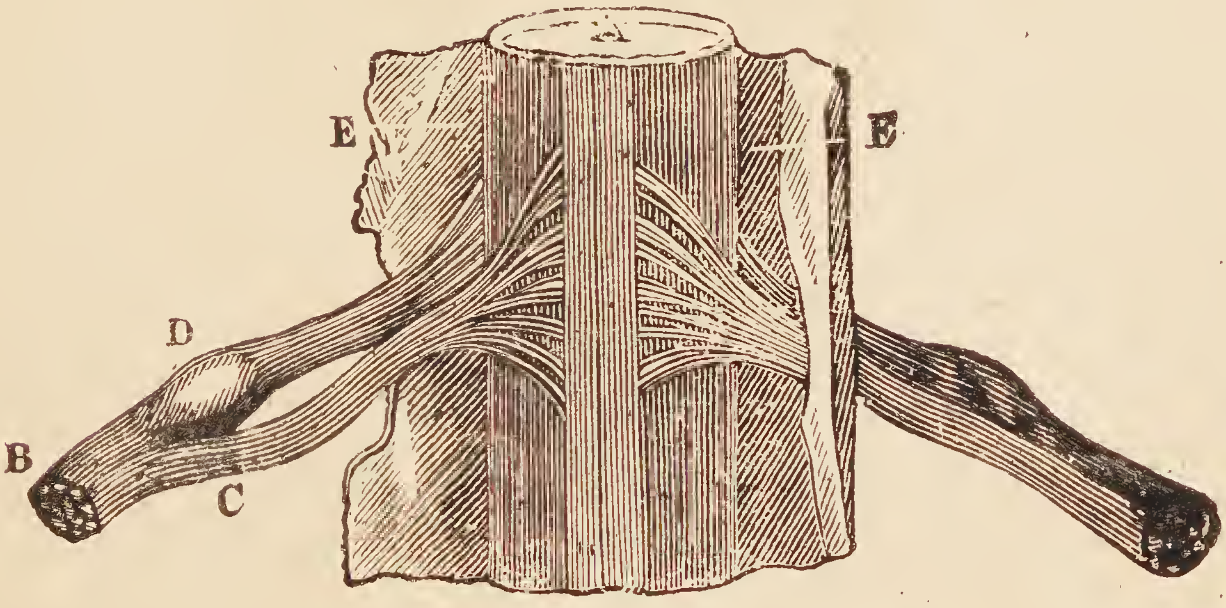
THE BRAIN

The whole of the upper part is called the cerebrum or brain proper. Below it in the back part of the head is what is called the cerebellum or little brain. Compared with his size the brain of man is very large; it is larger than that of a horse. In a full grown man it weighs about three pounds or a seer and a half.

Although the brain takes notice of every feeling it is itself but slightly sensible. It may be cut or portions of it removed without pain. The entire forepart of the brain of a dog may be removed, and yet the animal will live for months if properly fed. It will eat food when put into its mouth, but it will not go in search of it. Memory no longer exists. When the hind part of the brain is removed the power of walking or standing is destroyed. The animal in this state if laid on its back cannot recover its former position, but it moves its limbs. When placed on its legs, it staggers and falls; not however without making efforts to sustain its balance.

From the brain the spinal cord descends through the centre of the back bone. Like the brain, it is composed of two kinds of matter, the grey and the white. Unlike the brain it is highly sensitive. If slightly pricked, convulsions[1] follow; if much injured, breathing stops at once.

The Telegraph wires. Like the wires which come out from a telegraph office, there are little strings, called nerves, from the brain and spinal cord to all parts of the body. Twelve pairs go from the brain to the eyes, ears, nose and other parts of the body. Thirty-one pairs extend from the sides of the spinal cord.



NERVES FROM THE SPINAL CORD

The nerves are composed of the same matter as the brain. Each consists of a bundle of very small pipes, enclosed in a kind of sheath.

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[1] Violent motions of the body

There are nerves of sensation and motion. We feel by nerves of sensation. If we touch hot iron with our finger the nerve of sensation carries the feeling of pain to the brain. A message is at once sent by the nerves of motion for the muscles to withdraw the finger. The nerves of sensation come from the back part of the spinal cord; the nerves of motion from the front part.

If the nerve of sensation is cut, the part with which it is connected loses feeling; if the nerve of motion is cut that part cannot move. When a person has palsy and loses the power of motion it is because the nerves have been injured. Even pressure on the nerves stops communication with the brain. The foot loses its power of motion and feeling when the nerve that connects it with the brain is pressed by crossing the legs, or otherwise, and then the foot is said to be asleep.

If there were no nerves of feeling in the hand it might be burnt in the fire without our knowing it. Hence pain is intended for our good, to make us remove the hurtful thing which causes it. Pain in a broken bone makes us keep it still, without which it could not heal. The nerves of sensation are of different kinds. Some are sensitive to light, others to sound, others to smell and taste.

The picture on the next page represents the brain as cut through the middle, showing the different nerves which branch off. The top part is the brain; the lower part to the right is the little brain. Nerves branch off to the eyes, ears, nose, and mouth.

Another class of nerves, called sympathetic, consists of a series of knots on each side of the spine. They do not convey impressions to the brain like the other nerves. They seem to give the power of action to the heart and lungs, while we are not conscious of it, going on when are asleep as when we are awake. When the brain is strong and healthy the mind is vigorous. When a person's head aches, he is unfitted for study. When the brain is inflamed by strong drink, the person becomes like one mad. The same effect follows when the brain is diseased. Ignorant people sometimes attribute this to demons. When the brain is pressed with blood, as in apoplexy, the person become insensible.

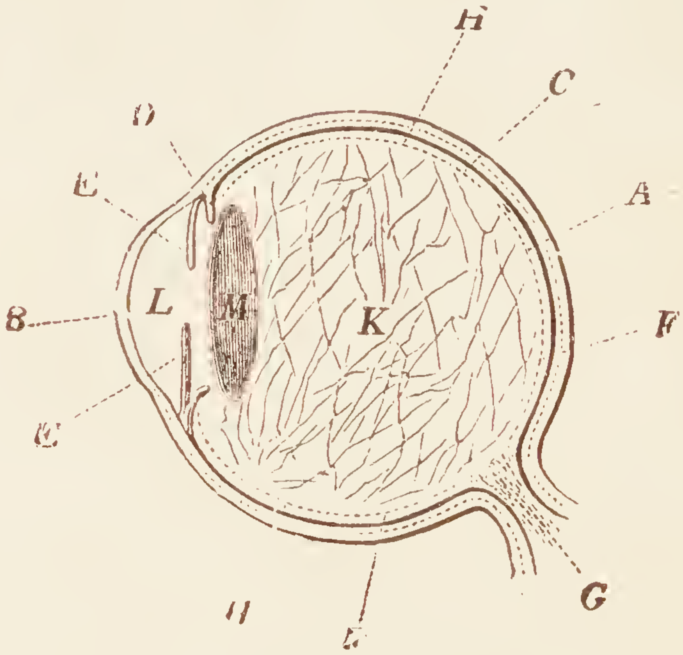
To work properly the brain needs a good supply of pure blood. For this purpose some time should be spent every day in the open air, either in walking or in sports like cricket. The brain also requires exercise and rest. It gains power by proper use; it is exhausted by excessive labour; it becomes weak by inactivity.

The brain of the young is delicate and should not be overworked. It is strongest in the early part of the day which should be devoted to severe study. Conversation and light reading before going to bed prepare for refreshing sleep. After a full meal the brain should have some rest.

Food is best taken at fixed hours; so the mind works best when it is exercised regularly. Some students try to make up for negligence during the early part of a session by over exertion before its close. This course is strongly to be condemned as fatal to success, and injurious in several ways.

The windows. In the front of the dome of my house there are two windows, far more wonderful than any which man can make—my eyes. By these my dwelling is lighted and is furnished with beautiful pictures of things around me.

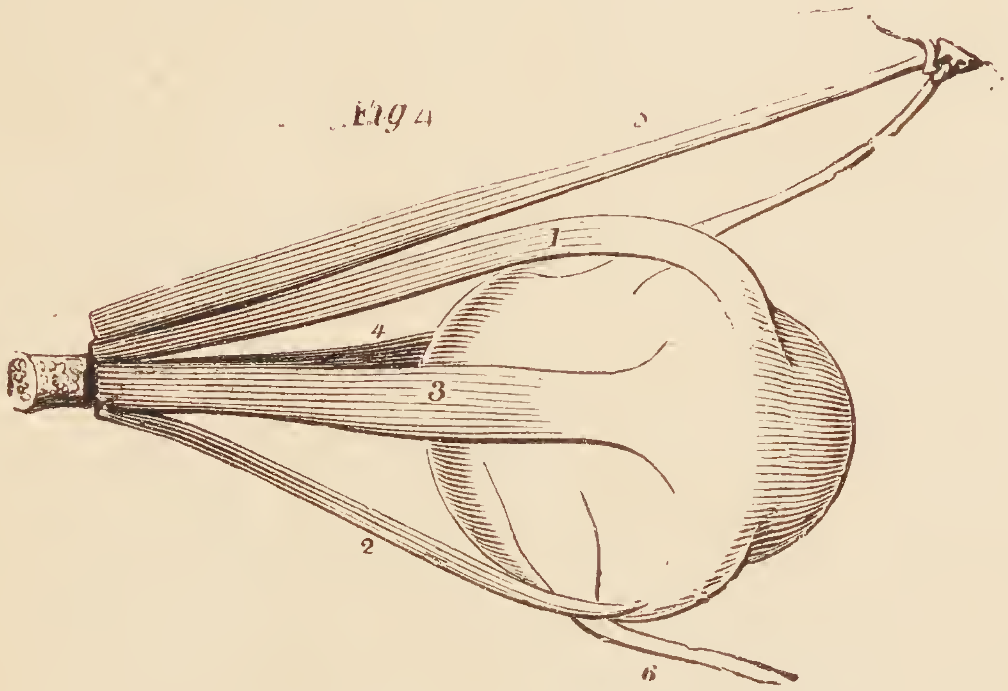
The eye is round to enable it to turn easily. Had it been square it would have been fixed. It has three coats. The outer coat is tough and white. It covers the whole eye except a round part in front. The middle coat is black and thin. The innermost coat, called the retina (*rete*, a net) is a delicate network, consisting of nerve substance from the brain.



SECTION OF THE EYE

The three coverings enclose three transparent substances. In front there are a few drops of a fluid like water. Behind it is what is called the crystalline lens. In substance it is like half-melted gum; in shape it is like two watch-glasses with their hollow sides placed together. Behind this, and occupying by far the greater part of the ball, is a fluid like the white of an egg.

The front of the eye is clear, and fits into the white coat very much as a watch-glass fits into the case. It is called the cornea. A little behind the cornea, there is a coloured iris or rainbow. It may be dark, blue or grey. The opening in the middle is called the pupil. The iris draws together or spreads out according to the quantity of light. In bright sunshine it draws together, so that the pupil is very small; in the dark, it is wide open, because the eye then needs all the light it can get. When we go out at night from a bright room, at first we cannot see anything; but the iris opens out, and then we can distinguish objects. In sunshine the pupil of a cat's eye is very narrow; in the dark it is wide open, enabling the cat to see at night.

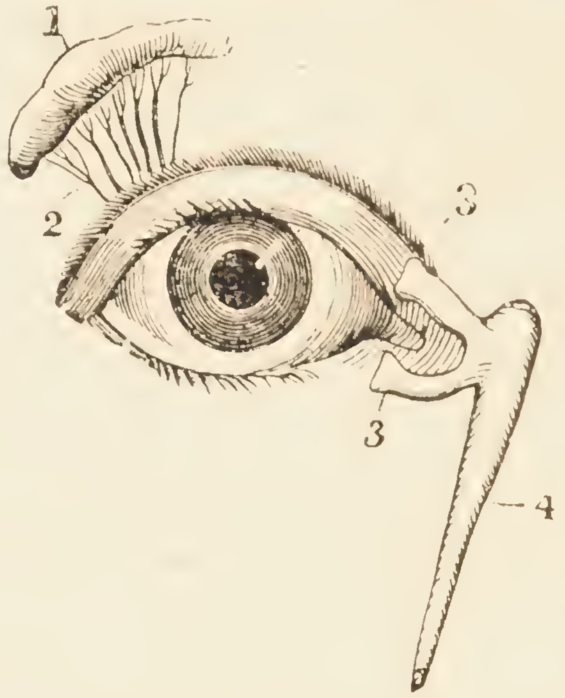


MUSCLES WHICH MOVE THE EYE

To pull the eye in every direction there are six muscles. We have two eyes, enabling us to see better, and if we should lose the one by an accident we have the other.

The eye is placed in the front of the head, where it is most useful. It is carefully guarded by the bones which jut out all around it. It lies on a soft cushion of fat, and it can be drawn back when threatened with a blow.

The eye is also protected by two shutters—the eyelids. They keep out the light of the sun, when it is too powerful, and they are closed in sleep. They likewise help to keep off small bodies like dust and flies. In this they are assisted by the eyelashes, which close so quickly that the twinkling of an eye is spoken of as the shortest conceivable space of time.



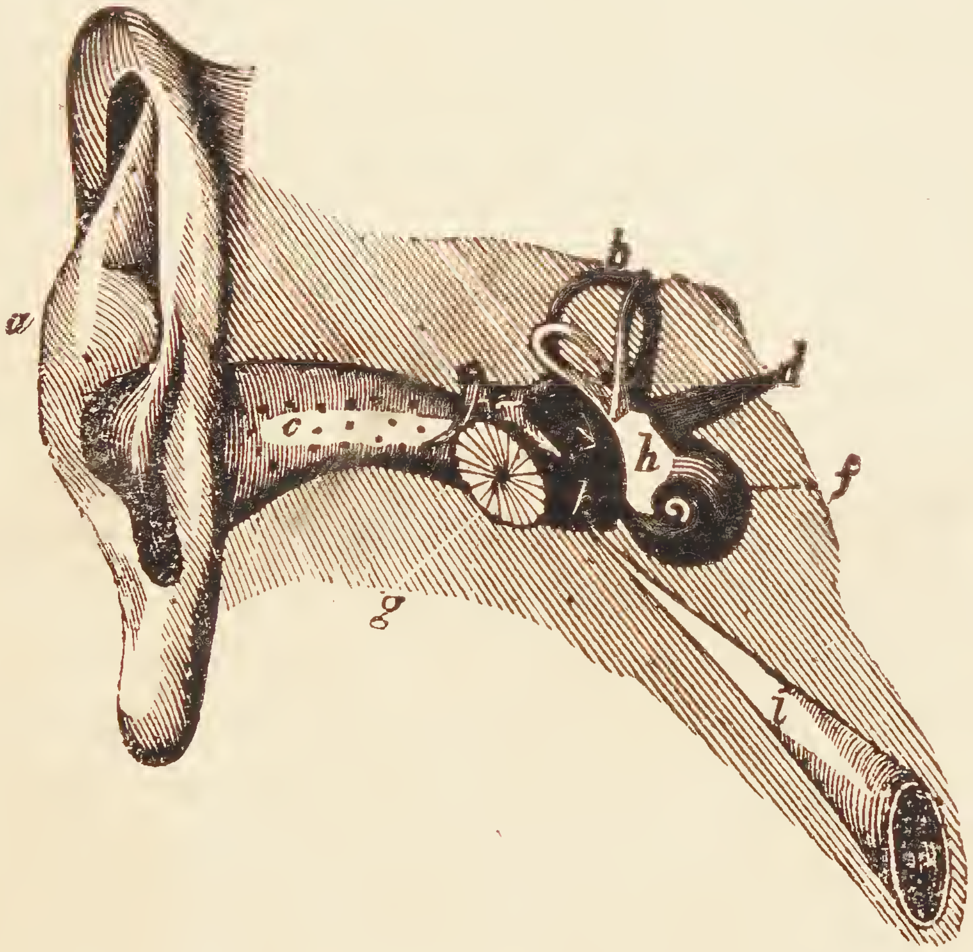
1, TEAR GLAND; 4, PASSAGE TO THE NOSE

Above the eye there is the tear gland. The tears from it are poured over the surface of the eye to keep it moist, and to wash away any substances that get into the eye. They are spread over the eye by the eyelids. To keep the tears from running over the lids, there is a little drain in the inside corner of the eye. The eyebrows keep the sweat on the forehead from running down into the eye.

The eye would be useless without light. They are fitted the one to the other, like a key and a lock. The eye has been called the queen of the senses. The ear can hear only within a short distance; the nose, the tongue, and the hand are still more bounded; but the eye traverses in a moment to the sun or stars. The way in which the eye is formed is so wonderful, that a famous physician, in ancient times, after examining it, wrote a hymn in praise of the great Creator.

The news doors. On the right and left sides of the dome are new-doors, called the bars. By these two inlets, the news of the country, the delights of music, the instruction of teachers and the sweet sounds of friendship find entrance. All this adds greatly to my happiness. Without it I should be lonely indeed in my abode.

In hearing the waves of sound are gathered by the outer ear, and sent into the hole where they strike upon a thin skin, called the *drum of the ear*, and make it shake. A chain of small bones connects it with another drum. This drum covers an opening into some winding passages in solid bone. These passages are filled with a fluid, and the shaking of the second drum makes this fluid shake. The fine threads of the nerve of hearing, floating in the fluid, feel the shaking, and an impression goes by them through the nerve to the brain, and the mind perceives sounds.



PARTS OF THE EAR

c, the pipe that leads to the ear; *g*, the drum of the ear; *b*, *f*, *h*, the inner ear; *d*, the nerve going to the brain.

The ear like the eye is carefully guarded. The winding passages are enclosed in the hardest bone of the body. The entrance bristles with hairs, slanting outwards, to keep out insects. It is also kept smeared with a bitter wax, which at once keeps the part supple and drives away intruders. The wax in the ear should never be taken out by a sharp instrument, which might pierce the drum of the ear.

Air is fitted to the ear as light is to the eye. The voice is also adapted to produce sounds.

The smell-door. There is a door in the dome of my house, below the two windows, by which smells enter; it is called the nose. Properly there are two little doors close to each other, called nostrils.

Many bodies are constantly giving out very small particles. Place some water in a cup in the sun, and it soon dries up-going off in vapour. Keep some camphor in an almirah, and after a time none will be left; it has all gone off in particles. The particles of some substances are exceedingly small. Musk will give out millions of particles for years, without apparently losing any of its weight.

The nose enables us to find out, in many cases, what particles are floating in the air around us.

The upper part of the nose is formed of bone; the lower of gristle, divided into two portions. The whole is moved by various muscles.

The nostrils run backward to the throat, with a large arched cavity above. To afford additional space, the cavity has many partitions. The whole is lined with a soft moist skin, over which are spread the nerves. The nerves of smell are like a leafless tree whose roots are in the brain, and whose branches and twigs spread over the lining skin of the nostril. The little particles enter the nostrils, and the nerves of smell perceive them, just as the mouth tastes food.

The sense of smell guides the lower animals in the choice of food. The dog can trace its companions by smell when it can neither see nor hear them.

The nose also affords a passage to the air, and allows breathing to go on when the mouth is closed.

The food-door. My house has a door by which all supplies of food enter—the mouth. If this door were closed for ever, my house would soon fall into decay.

Proper care is not taken of the food-door. We often eat what we should not eat; drink what we should not drink; eat too much of what we may eat, and drink too much of what we may drink. The food-door is also useful for other purposes.

Taste. We are generally said to taste with the tongue, but the nostrils have much to do with it. Every thing must be dissolved in water before the tongue can taste it; hence it is provided with saliva. In the back part of your tongue you can see little raised points. The nerves in them going to the brain give the sense of taste.

Taste, like smell is given to us partly to enable us to choose wholesome food. There are three watchmen to examine it. The eye first looks at the food, the nose smells it, and the mouth tastes it.

Speech. We can make known our feelings, to some extent, by gestures and the expression of the face. We can thus show whether we are pleased or angry, joyful or sad. A dog when he is pleased, looks up at you and wags his tail; but he cannot laugh or frown. Some of the lower animals can utter sounds. The dog barks, birds sing. Man alone has the gift of speech. A few birds may be taught to repeat words; but they cannot use them as we do in connected, reasoning speech.

Every syllable we utter requires a particular action of the tongue. Its muscles are so numerous and so much folded that they cannot be traced, yet how nimbly do they act!

Speech is a great power for evil or good. Alas how many are the sins of the tongue! Lying, filthy language, evil speaking, words stirring up strife, and causing angry feelings which last for years. 'The tongue can no man tame.' Let us therefore offer the prayer. 'O Lord, keep thou the door of my lips.' Let nothing pass from it, but words spreading knowledge, peace, and joy all around.

Touch. This has been called feel-gate. Every part of the surface of the body has more or less the sense of touch. In this respect it is the widest of the senses. But the hand, with its fingers, is pre-eminently the organ of touch. Nerves of feeling are distributed all over the body, but they are especially numerous at the points of the fingers. By means of its numerous joints, the hand is also better fitted than any other member of the body for grasping objects. The eye, the ear, and the nostril stand simply open; the hand chooses what it shall touch.

The five senses have been called the gateways of knowledge—eye-gate, ear-gate, nose-gate, mouth-gate, and feel-gate.

CARE OF MY HOUSE

In describing each part of my house, directions have generally been given how to take care of it; but a short summary of the rules may be useful.

Some people think that sickness comes by fate or chance, and that they cannot help it; others look upon it as caused by evil spirits, or as sent by God.

There is no such thing as fate or chance. When we get ill, there is some reason for it. God wishes us to be healthy and happy. Sickness is mainly brought about by our own ignorance and misconduct.

To have good health we should attend to the following rules:—

1. PURE AIR SHOULD BE BREATHED. Air is what is most needed to preserve life. We should have plenty of it, and it should be pure.

2. GREAT CARE SHOULD BE TAKEN ABOUT WATER. Much of the fever and cholera in this country is caused by bad water. Every means should be used to get good water ; but if it cannot be had, the water should be boiled before drinking it.

3. ONLY WHOLESOME FOOD SHOULD BE EATEN, AND NOT IN EXCESS. Decayed food of any kind should never be eaten. Double care is necessary about food when cholera prevails.

4. CLEANLINESS IS ESSENTIAL. The body, clothes, house, and compound, should all be kept clean. Plague is largely the result of dirt. Filth is the mother of sickness.

5. SUFFICIENT EXERCISE SHOULD BE TAKEN. Students and clerks should pay special attention to this.

6. CLOTHING SHOULD BE SUITED TO THE SEASON. Warm clothing is a great preservative against fever and cholera.

7. FEVER SHOULD BE GUARDED AGAINST. When it is prevailing, do not go out in the morning fasting, and take good food in sufficient quantities. Avoid exposure to the sun, to great fatigue, to the dew, and to night air. Do not sleep in the open air. Wear warmer clothing than usual. Especially keep the body warm at night. Observe the directions about water.

8. TEMPERANCE AND CHASTITY SHOULD BE OBSERVED. Indians should adhere to the temperate habits of their forefathers, and avoid all intoxicating liquors. Water is best. Early marriage and sensual indulgence cut short the lives of many.

9. EVERY DAY SEEK GOD'S BLESSING. 'Except the Lord keep the city, the watchman waketh but in vain.'

THE RESTORATION OF MY HOUSE

The house I live in is superior to any other house in this world in many respects; but most of all because after it is decayed and seemingly destroyed, it can be restored again, and so improved that it will continue for ever a glorious building.

When the soul's abode came from the hand of the divine Architect, it was pure, fair, and perfect. Man allowed sin to enter, who brought with him pain, sickness, and worse than all, the cruel king death.

Although we had ruined our house entirely by our own fault, God, the divine Architect, graciously provided a way in which it might be renewed.

Man had broken God's law. Either he must suffer the penalty or some one must suffer in his room. God so loved the world that He gave His only Son, the Lord Jesus Christ to be our Saviour. Jesus Christ became incarnate, died on the cross for man and perfectly obeyed the law of God. Salvation is now offered to all who trust in Jesus as their Saviour. He answers for their sins; for His sake they are counted righteous. Their hearts are purified by the Holy Spirit.

If I accept Jesus Christ as my Saviour, renouncing all other grounds of hope, I shall live in my house under His constant care. When He directs, I shall have to quit this tenement, and then it will fall to entire decay. The Lord Jesus, its owner, will, however, never forget it, but in due time restore it and reinstate me in a building of God, a house not made with hands eternal in the heavens.

We cannot fail to see the goodness of God in bestowing upon man such a wonderful house to live in. His skill designed it, His power created it. Let us remember this and show our gratitude for the gift and its daily preservation by using it always to do good. Let us present our bodies, a living sacrifice, holy and acceptable unto God which is our reasonable service.

Take my life, and let it be
Consecrated, Lord, to Thee.
Take my moments and my days,
Let them flow in ceaseless praise.
Take my hands, and let them move
At the impulse of Thy love.
Take my feet and let them be
Swift and beautiful for Thee.

Take my voice, and let me sing
Always, only, for my King.
Take my lips, and let them be
Filled with messages from Thee.
Take my silver and my gold ;
Not a mite would I withhold.
Take my intellect, and use
Every power as Thou dost choose.

Take my will and make it Thine ;
It shall be no longer mine.
Take my heart, it is Thine own ;
It shall be Thy royal throne.
Take my love ; my Lord, I pour
At Thy feet its treasure-store
Take myself, and I will be,
Ever, only, all for Thee !—HAVERGAL.

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